

Studies in German and English Morphology
with special reference to 'linking elements'

Bettina Isensee Montgomery

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Abstract

This thesis is primarily concerned with the status and derivation of linking elements in German (and, to a lesser extent, English) compounds, with the question of whether such linking elements are inflectional suffixes, and with the problem associated with the apparently low predictability of such elements. A number of empirical and theoretical issues arising from that analysis are discussed – among those the claim found in recent research whereby German has retained the morphological category ‘Stem’, while English has lost that category.

The thesis is couched in the framework of recent, ‘base-driven’ Lexical Morphology and Phonology. The data under investigation support a model of lexical stratification which posits three strata for German (root, stem and word-based respectively) and two (root and word-based respectively) for English.

Chapter I provides an introduction to the theoretical background of the thesis, as well as addressing a number of notions and concepts which appear to be ‘established’ in linguistics, but which nevertheless have defied full understanding or satisfactory definition – for example the difference between inflection and derivation; the difference between the lexical categories root, stem and word; the issue of storage within a model of the lexicon.

Chapter II investigates the morphological category Stem in German by discussing both the morphological processes which give rise to verb stems, and the morphological processes which require verb stems as their input.

Chapter III presents an analysis of [[Vstem] [N]] compounding in German: a variety of formations is discussed and the linking element /ə/ is analysed in terms of its phonotactic, morphological and semantic triggers.

Chapter IV is a comprehensive study of the phenomenon of linking elements in the juncture position of [[N] _ [N]] compounds in German. All linking elements which can be found in German nominal compounds are by appearance a proper subset of nominal inflectional suffixes. It will be argued that, with the exception of -s-, the so-called ‘linking elements’ in German nominal compounds can be interpreted as inflectional endings. The issue of blocking, where /ə/ is blocked from appearing in the juncture in such cases where (1) the noun is homophonous with a verb stem, (2) the noun ends in /ə/, is also explored.

Chapter V draws comparisons between the German material and compounding in English. Difficulties with the definition of ‘compound’ vs. ‘phrase’ are discussed. Again, an investigation into the nature of ‘linking elements’ is presented; in light of the German data, the possibility of inflection within compounding is considered.

Declaration

I declare that this thesis is entirely my own work, excepting the instances which are noted, and that no part of this thesis has been previously published or submitted for any degree.

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Bettina Isensee Montgomery

Chapter I: Introduction to the theoretical background

I Introduction

“... we have the sense of discovering an unexpected fact about language, of being surprised by a hidden orderliness in our world.” (Zwicky, 1992:359-60)

Imagine the perfect Theory of the Lexicon. It can define the notion of ‘impossible word’ versus ‘possible word’ versus ‘actual word’. It can predict possibilities and impossibilities of inflection, derivation and compounding accurately and with only a few exceptions. It has found a way to account for the storage of simplex and complex lexical items alongside rules, to guarantee both productivity and quick and accurate retrieval of frequently used forms. It can explain the expansion of the lexicon and the acquisition and storage of new items and new processes. It allows for storage facilities with productivity options which provide the possibility of interaction between syntax, morphology and phonology, and which are easily accessed. It can explain some of the most peculiar facts of language and yet be of accessible and simple lucidity.

The pursuit of a perfect theory, combined with the adaptation of data to fit such a theory, is not the aim of this thesis. The analysis which is undertaken here is, rather, an attempt to account for specific sets of data in both English and German, which necessarily includes a theoretic framework of some kind. The data under discussion centers around the problems involving the nature of linking elements in German compounds, specifically within verb-noun and noun-noun combinations. In order to put these issues into a wider perspective, an excursion into morphological processes involving verb stems in German, as well as a comparison with compound formation in English is also included. The theoretical concepts which are of crucial importance to the analyses are that of root vs. stem vs. word, and the issue of inflection vs. derivation; the main aim of the thesis is to establish whether or not linking elements can be interpreted as inflection.

Overall, this thesis has as its theme morphological processes in English and German. The fact that the analyses are conducted in what can be broadly termed the ‘framework of Lexical Phonology’ (henceforth LP) is only of importance inasmuch as the theory (or, a slightly amended variation of the theory) serves well to explain the problems, and provides a backdrop for possible ways to solve them. The thesis does not constitute a defence of Lexical Morphology or Phonology as a theory. There are of course a multitude of other theories which could have been used instead, the most obvious omission being Optimality Theory (OT).

I have chosen not to work within an OT framework, not only because I am not convinced that it is any better than LP as a means of presenting the data I am working with, but also because I have many more problems with the validity of OT as a theory than I do with LP. Considering I have some very strong reservations about LP, too (see 1.2 below), this requires a brief explanation.

OT works by selecting the ‘optimal’ candidate from an input of ‘likely’ candidates created by GEN, the generator, by means of a number of ordered, violable constraints. OT’s approach has certain advantages (cf. Archangeli, 1997:27): it defines a clear and limited role for constraints, which are (a) universal, and (b) ranked according to EVAL, the evaluator; the ranking of constraints expresses distinctions between languages, and there is no need for rules anymore at all; the main focus is on the universality of constraints. Constraints are assumed to be both universal and innate, and only the (language-specific) ranking of constraints needs to be learned. While this is a good idea theoretically, the problems arise when analyses that have been undertaken in OT are examined. The claim that constraints express universal tendencies in languages (Prince and Smolensky, 1993:5) imposes an immense responsibility on linguists working within OT, in that one needs to be very careful

when stipulating a new constraint during the course of an analysis, otherwise the basic principle of the theory is endangered. And that is exactly where one of the main problems lies; OT has not been practised for that long (having emerged from Prince and Smolensky (1993)), and yet the number of constraints that have been proposed in the literature is already enormous. Raffelsiefen (1995), for example, presents a study of the phenomenon of schwa in German proposing 11 constraints. Some of these turn out to be “language specific” (Raffelsiefen, 1995:39-40), something which constraints ought not to be. Others, still worse, only seem to work for certain word categories within the specified language: her constraint SHELL (which prohibits a specific cluster of sonorous consonants) is only working for some adjectives and nouns, and fails when applied to verbs; and yet, this failure to apply is not discussed (Raffelsiefen, 1995:29). While this may be the fault of this specific analysis, the overall tendency of the problem has been noted elsewhere (e.g. Blevins (1997)), even in the textbooks themselves:

“The ideal which Optimality research aims for (and sometimes appears to fall short of) is to provide evidence of the universality of each constraint necessary for some particular language. For constraints such as the ones posited for syllabification in this chapter, universality is readily motivated; there are numerous analyses involving constraints whose status as a universal is minimal at best. At this point, it is unclear whether this is a weakness of the model itself, or a weakness of the analyses.” (Archangeli (1997:15, fn 3))

For a comprehensive demolition of OT as a valid theory, see McMahon (2000).

The presentation of data, and the processes of derivation and inflection throughout the lexicon as they are discussed in this thesis, are easier illustrated in a lexicon as it is envisioned in LP, and the rules or generalisations seem to me to be more straightforward than a host of constraints could be.

Chapter I presents some basic observations about word forming processes in the lexicon which lead to the subsequent analyses: the issue of inflection vs. derivation, the notion of

root vs. stem vs. word, and some general factors about the state of LP as a valid theory, particularly the aspect of a base-driven as opposed to an affix-driven model. All of these topics will be taken up again at various points in the thesis, and many of the analyses are offered as evidence for a distinction which proposes 3 strata for the German lexicon, and 2 for the English lexicon (cf. e.g. Giegerich (1999)).

Chapter II illustrates visible stem-formation in German: it offers an overview of morphological (specifically: derivational) processes involving the German verb: processes with verbs as the outcome, and processes with verb (stem)s as the input.

Chapter III extends the analysis of the German verb to include compound formation of the kind [[Vstem] [N]], and discusses the issue of linking elements within this particular kind of compound formation. The topic of the categories root vs. stem is shown to be linked to the investigation of linking elements, and the question of whether those can be interpreted as inflection or not.

Chapter IV is a detailed analysis of nominal compounding in German; an attempt is made to settle the notoriously unwieldy data, and provide rules for the insertion of linking elements in the juncture position of any [[N] __ [N]] compound in German. The analysis is conducted in two parts: part (1), which deals predominantly with already existing compounds, analyses each linking element in turn and seeks to establish regularities of their distribution from this perspective; part (2), in which the data is produced spontaneously, approaches the problem for each noun class separately, and offers evidence as to the nature of linking elements.

The reasons that an analysis of the juncture position between [[Vstem] __ [N]] and [[N] __ [N]] compounds is conducted here in such detail are varied: The primary objective is to find an accurate definition of inflection and derivation which is based upon visible evidence as to

the finer points of distinction and, founded on this definition, to come to a conclusion as to whether or not linking elements could be classified as inflectional affixes. The issue of linking elements in German [[N] [N]] compounds in particular, however, turns out to be much less well researched, let alone ‘settled’, than I had initially believed, and all previous research on this topic had at some stage come to the conclusion that, really, there is no conclusion to be had. The two approaches to the problem presented in chapter IV yield results that, as far as I am aware, have not been stated in such a way. As indicated above, the theoretical aspect is of secondary importance in the analysis. It is quite possible that there is a notation which offers a more reader-friendly presentation of the results than the tentative format used here, involving neither rules nor constraints but perhaps relationships of the kind “if A then B, if *A then C”, as they are expressed in computer programming. Overall, the clarity of presentation may be somewhat clouded by both the volume and the nature of the data; the organisation I have chosen (cf. Appendix) allows for the greatest amount of ‘orderliness’ without compromising potentially important distinctions through category conflation.

The final chapter, V, is an attempt to compare the analysis of the data of the two preceding chapters on German compounding to apparently similar phenomena in English compounding. The chapter also contains a detailed discussion of the definition of ‘compound’ vs. ‘phrase’, a distinction which is unproblematic in the analysis of German compounds, but notoriously difficult in English. The comparison of the data of the two languages is largely motivated by the fact that both languages are related to the extent that one might hypothesise (broadly speaking) that English is now where German is heading, while German can give an impression of what the interaction of English morphology and phonology may have been like.

While the overall approach used in the thesis is that of a synchronic analysis, some aspects of diachrony are on occasion referred to when they may serve to explain the status quo which exists today. The maxim that ‘today’s morphology is yesterday’s syntax’ (cf. Givón (1971)) is of particular interest in the discussion of compound parts and their (case-) relationships with each other in chapters III, IV and V; and in the final chapter the diachronic development of an individual speaker’s lexicon is also taken into account.

The main issues which are dealt with in this thesis are morphological and phonological processes, and the interaction between them; the main challenge turns out to be finding a solution to one of the major problems in German morphology: the linking element in the juncture position of nominal compounds.

1.1 Outline of Chapter I

The first chapter of the thesis will mainly provide the theoretical context in which the subsequent analyses are conducted. 1.2 offers a brief introduction to the theory of Lexical Phonology, with a short overview of how some aspects of the theory have developed during the past 15 years or so. This outline also explains the necessity for the subsequent sections on definitions of what may be viewed as rather basic concepts. 1.3 attempts to define as accurately as possible the terms ‘root’, ‘stem’ and ‘word’, which are crucial concepts for the approach of base-driven stratification which is pursued here. The definitions depend partially on the notions of inflection and derivation, which are discussed in 1.4, with an overview of past definitions and the consequences these have for the model of LP as it stands today. 1.5 discusses one particular difficulty of the lay-out of the model of the lexicon as it is proposed so far: the issue of storage of complex items as it appears to be necessary

based on psycholinguistic evidence. 1.6 sums up the theoretical background as it has been presented in this chapter.

1.2 Lexical Phonology: A brief introduction to the theory

This section offers only a very brief introduction to the theory of Lexical Phonology (LP). Essentially, LP attempts to illustrate all word formation processes based on the interaction of morphological and phonological rules, which are located in the ‘lexicon’¹ and ordered there on different levels (“strata”). There is a large number of books and papers on the origins and developments of LP (e.g. Siegel (1979), Kiparsky (1982a, 1982b, 1985), Selkirk (1982), Halle & Mohanan (1985), Mohanan (1986), Booij and Rubach (1987), Szpyra (1989), Hargus and Kaisse (1993), Giegerich (1999)), all of which present more in-depth discussions on various aspects of this theory.

LP is a generative model, which seeks to avoid some of the excessive abstractness which other theories of generative phonology (e.g. Chomsky and Halle (1968)) have often been accused of. It is also one of the first generative linguistic theories which tries to account for morphology, a part of linguistics which until the advent of LP has been somewhat neglected. Located within the ‘lexicon’, a set of underlying morphological representations is transformed into their surface structures by undergoing a number of ordered and structured rules. These rules are situated at different levels (‘strata’) within the lexicon, and are a mixture of morphological and phonological operations which interact with each other. This interaction is one of the most important aspects of the theory of LP; it means that on certain levels (i.e. level I in English and levels I and II in German) cyclic rule application is possible, and phonological and morphological rules work in tandem with one another.

¹ The proposal that the lexicon should be seen as the domain of the interaction of phonology and morphology is first discussed in Aronoff (1976) and Lieber (1981).

Originally, the strata within the lexicon were assumed to be ‘affix-driven’, and the stratal distinction was made according to ‘Latinate, exceptional’ and ‘Germanic, regular’ processes. The split into two strata for English was based on the notably different behaviour of the two classes of affixes; for example:

- class I affixes (e.g. *-ic*, *-ity*, *-th*, *-ian*, *-ion*, *-al* etc.) can attach to bound as well as free forms, while class II affixes (e.g. *-ness*, *-less*, *-some*, *-ful*, *-er* etc.) only ever attach to free forms;
- class I affixes only stack onto other class I affixes (never onto class II, e.g. *-ic-ity*, but **-ness-ity*), while class II affixes may attach to both (e.g. *-ic-ness*, *-less-ness*);
- class I affixes are stress-shifting, while class II affixes are stress-neutral (e.g. *'atom - d'tomic*; *'atom - 'atomless*);
- class I affixes do not trigger *mn*-simplification, while class II affixes do (e.g. *autumnal*, *damnation*; *autumny*, *damning*);
- /g/ dropping after [ŋ] does **not** occur before a class I affix, but it does occur before a class II affix (e.g. *diphthongise*; *diphthonging*);
- class I affixes trigger TSS (Trisyllabic Shortening), class II affixes don't (e.g. *divine - divinity*; *child - childless - childlessness*) etc.

The first to note such an ordering of affixes was Siegel (1979) (though not in connection with stratification); both she and Aronoff (1976) observed that the **majority** of affixes displayed an unambiguous affiliation with one or the other of the two groups. This, however, is where the problems for this kind of stratification approach lie: further study revealed not only that there are numerous exceptions to most of the points mentioned above, but also that an affix-driven approach to stratification crucially depended on the completely unambiguous stratal affiliation of all affixes in order to be credible. This turned out not to be the case; in fact, a very large number of affixes were found to have ‘dual membership’.

The 'lexicon' as it is seen in LP is not simply a storage facility (like a 'dictionary') which merely lists lexical items (though it does that, too); it also, and more importantly, has mechanisms which can produce new lexical items. Throughout the development of the theory, a range of models has been proposed, with varying numbers of strata, and different rules located on them: Kiparsky (1982a) proposes three strata for English, which in (1985) he reduces to two; Mohanan (1986) suggests that there are four strata in English with a 'loop' feeding items back to an earlier stratum if this should be required etc. The main difficulty with all these models was that the strata were based on the distinct properties of the affixes which were sited on them; this in turn was found to be untenable simply because of the sheer number of affixes that could be found on both strata (cf. Szpyra, 1989:46ff; Giegerich, 1999:21ff). Various accounts which tried to argue that this was due to the fact that these conflicting affixes were actually different (though identical looking) affixes (e.g. Katamba, 1993) eventually failed. An alternative was proposed as early as Selkirk (1982:77); Sproat (1985:459) also takes up this suggestion: "The other method is to make a distinction between morphological entities such as stems and words and assume that various morphophonological processes select for one or the other of these."² The current state of the theory (e.g. Giegerich, 1999) proposes 2 strata for English, which are founded upon **base-driven** stratification (i.e. resting on the two distinct categories 'root' and 'word' for English); a stance which simply approaches the issue from the 'base' rather than the 'affix'.

In the base-driven approach to stratification, the only generalisation about the two distinct categories of affixes which seems to still hold true is taken as the starting point, namely that stratum I processes may deal with **bound forms** and generally more exceptional rules, and that stratum II houses all operations involving **free forms** and the generally more regular

² Sproat (1985:460) proposes only two distinct base categories (called 'category levels' in Selkirk, 1982) for English ('stems' and 'words') and advocates a base-driven lexicon with two strata in English, founded on these two categories. His definition of 'stem' is identical to what I propose to call 'root', cf. I.3 below: "Stems I take to be the form in which basic lexical entries are listed." (1985:460)

and frequent processes³. It is evident that if such importance is attached to the bases on which morphological operations are performed, these bases need to be well-defined. This is why, in I.3, I discuss the terms ‘root’, ‘stem’ and ‘word’ in detail, and note the distinction between how the terms are used here and how they are sometimes used in the literature. The result of the base-driven approach is a lexicon with two strata for English, and three strata for German.

The range of processes that are at work on the different strata which are necessary to constrain the application of rules correctly has also undergone modifications (cf. the Elsewhere Condition (Kiparsky, 1982a:8), Strict Cyclicity (Kiparsky, 1982a:41), the Root-to-Word Conversion (Giegerich, 1988, 1994, 1999) and the Blocking Effect (Giegerich, forthcoming)).

The Elsewhere Condition (EC) stipulates that a ‘specialised’ rule with listed inputs applies first and prevents the form it has been applied to from undergoing the ‘general’ rule. For example, *ox* would receive its exceptional plural affix *-en* on stratum I, and be subsequently prohibited from any application of the productive plural affixation *-s* on stratum II. In German, a compound of the type *Kindbett* ‘lit. ‘childbed’: period of post-natal recovery’ with its very specific semantics must be located on a higher level than e.g. *Kinderbett* ‘cot’, which thus accounts for the distinct output.

From EC, which has been proven to be an independently motivated constraint in the grammar (not just within LP) (cf. Kiparsky (1982a)) another very important constraint has been derived, namely the Strict Cycle Condition (SCC):

³ This is true even in light of exceptions of the kind *gorm-less*, *hap-less*, *grue-some*, *cran-berry* etc. Although here we clearly have stratum II affixes attaching, it is overall very rare indeed for these affixes to attach to bound base forms; the only sensible way to deal with examples of this kind is to list them as complex lexical entries on stratum I, since affixation of this kind cannot be said to be productive.

- a. Cyclic rules apply only to derived representations.
- b. Def.: A representation Φ is *derived* w.r.t. rule R in cycle j iff Φ meets the structural analysis of R by virtue of a combination of morphemes introduced in cycle j or the application of a phonological rule in cycle j.

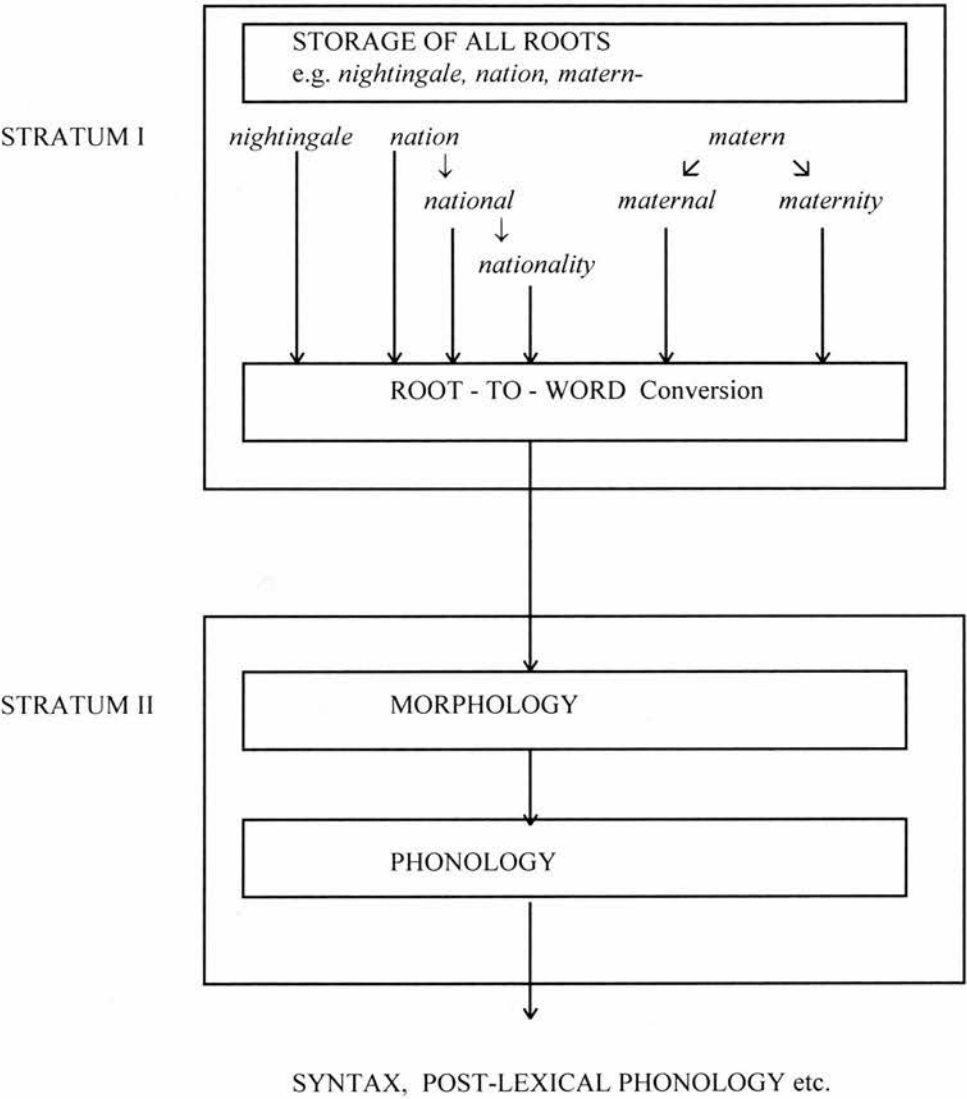
(Kiparsky, 1982a:41)

SCC is operative as a constraint on those strata which also have cyclic rule application, and it restricts the application of cyclic rules to those forms which have undergone some form of derivation **on the same cycle**. For example, a rule like TSS (Trisyllabic Shortening) does not apply to underived environments like e.g. *nightingale* or *ivory* (whose trisyllabicity is not the result of a morphological operation), but will apply to *deprivation* or *national* who are trisyllabic after affixation on stratum I. TSS will not, however, apply to *weariness* or *slavery* (items which become trisyllabic on stratum II, which is non-cyclic, and where TSS is no longer operational).

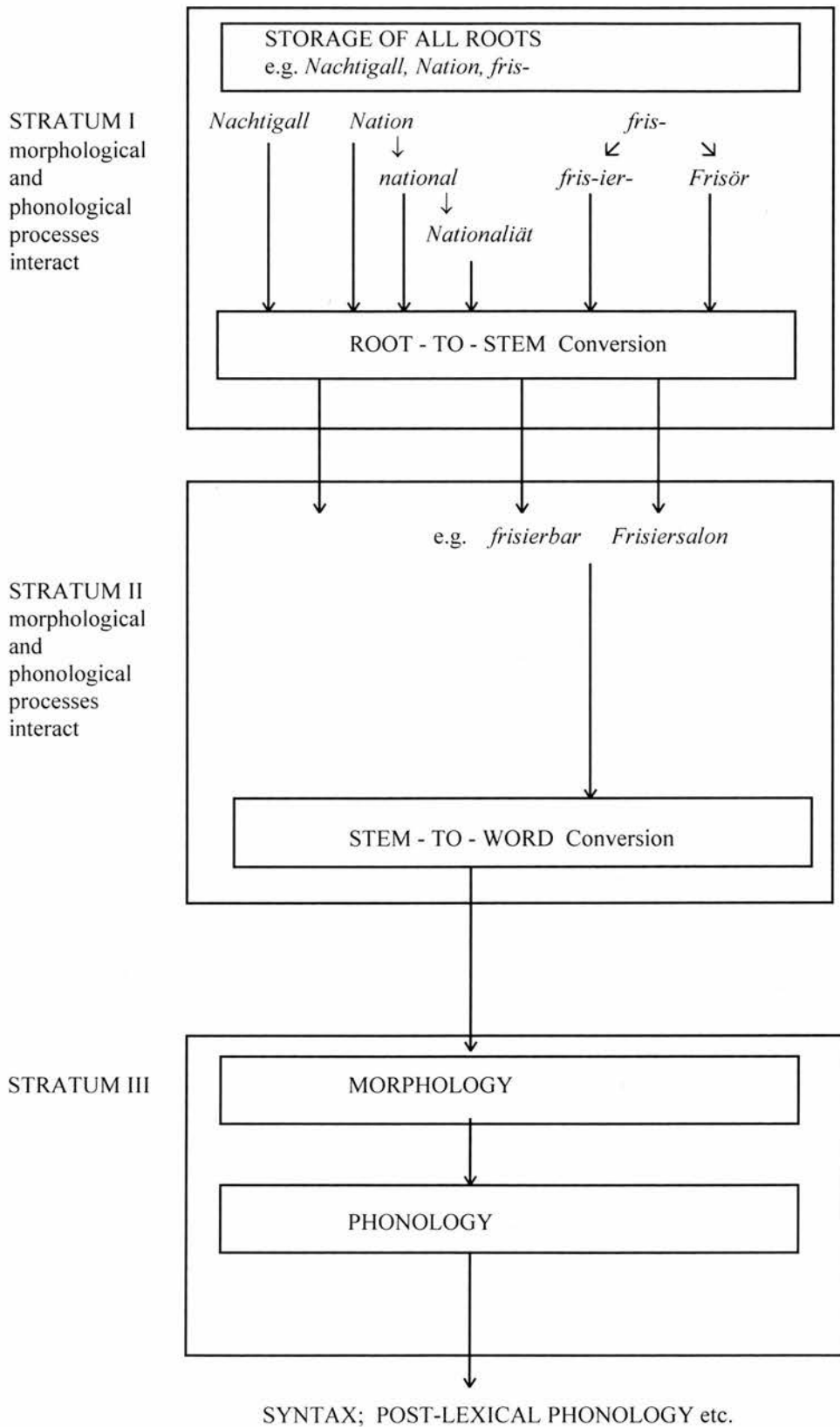
Only a few of these issues, however, will be focused on throughout this thesis (though some others may be touched upon, e.g. the Blocking Effect). The main topic which is underlying the investigations undertaken here is that of base-driven stratification, and this thesis constitutes an attempt to prove that there is a visibly and functionally distinct category in German (which will be called ‘stem’) which does not (or, perhaps more accurately: no longer) exist in English. It will be shown that this category is the cause of the existence of a third stratum in the German lexicon (the intermediate stratum), for which there seems to be no need in English.

A tentative approach at the outline of both models might look like the following:

BASIC MODEL OF THE LEXICON FOR ENGLISH:

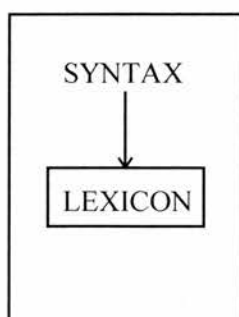


BASIC MODEL OF THE LEXICON FOR GERMAN:



The analyses in chapters III, IV and V also attempt to make predictions with regard to the interaction of inflectional and derivational morphology, and on which strata in the lexica for English and German respectively the various processes would need to be situated in order to apply in the correct sequence, and with sufficient restrictions. Such interaction between inflection and derivation (as e.g. exhibited by linking elements in nominal compounds in German, cf. chapter IV) is by no means undisputed, and an in-depth discussion of ‘inflection’ and ‘derivation’ will be presented in I.4.

There are a number of issues which are either not at all or only superficially dealt with here, and which seem to me to be of grave concern for the theory of LP as a whole. One of these topics is the relevance of syntax to the formation of words⁴; this appears particularly problematical since LP does not make any provisions at all for this, and yet inflection is seen as part of word formation, and is said to be located within the lexicon (e.g. Giegerich (1999:61)). Presumably the entire lexicon would need to be situated in a wider concept containing syntactic triggers of some sort, which prompt the production of the grammatically correct output form. The problem is indirectly illustrated in the preceding basic models of both the German and the English lexicon within LP: syntax is positioned after all intra-lexical processes are completed, and is only considered as relevant where post-lexical rules are concerned. Perhaps a more psychologically appropriate model would be one in which syntax **initiates** the word formation processes:



⁴ Sproat (1985:74), for example, argues against the notion of a lexicon or a word-formation component which has no contact with syntactic information at any stage.

Closely connected to this fundamental problem is the issue of semantics; again, the theory of LP does not make any provisions for a semantic input to the word formation process, and again, such an input is clearly desirable. To put it bluntly, LP has fine-tuned the possible mechanics of word-formation, but has not taken into account psychological reality which requires triggers for this process. By comparison, Optimality Theory also fails as a theory on similar grounds, because the function GEN, the generator which produces the possible inputs to the selection process, is not motivated by psychological reality, semantics or syntax, but rather by the need to constrain the volume of inputs to the ranked constraints somehow. The fact that GEN is otherwise not very well motivated, nor well-defined or well-constrained, is another problem altogether.

LP (as it is practised today, cf. Giegerich (1999)) also has what appears to be a flaw in that its base-driven divide depends upon root-to-stem (German) or root-to-word (English) conversions, which assign grammatical category. This in turn means that anything prior to these conversions is a root, crucially lacking this information. And this is of course highly undesirable for all the native, morphologically simplex, and frequently occurring words of the language (this criticism applies to both German and English), which never undergo any kind of structure changing transformations, and whose lexical category never changes.

It is similarly difficult for LP to account adequately for any aspect of diachrony, even such 'diachrony' as can be said to occur within one adult speaker's lexicon over a relatively limited period of time. One particular aspect of language acquisition is preliminarily discussed in chapter I.5, and subsequently returned to in chapter V, namely that of an apparent need for increased storage facilities, to account for quickness and ease in accessing not only irregular but also frequently used regular forms. The original model of the lexicon as it has been presented above is unable to make such distinctions, and it will become clear

that a great deal of alterations are necessary in order to account for phenomena such as these.

That said, LP has been chosen as the framework in which to present the findings of the subsequent analyses in this thesis, because its means of dealing with the intricacies of the actual process of word formation are excellent. LP provides a clear model of two (three) strata, the levels which represent the distinct bases in English (German), on which the variety of structure-changing and structure-building processes are located. It is these specific processes of word formation which lead to the sometimes rather complex constructions which are the main focus point of the thesis. Were I more concerned with the mechanics of triggering such processes, or with the wider perspective of where the construction of a word may be situated in a person's mind, or even the presence of a Universal Grammar in any individual's mind (an OT pursuit), I would undoubtedly have chosen a different theory in which to work. Of course, it would have been equally possible to present the findings and the analyses of the data in no particular framework at all - that, however, would have created even more difficulties in the organisation of the findings, and I doubt that the result would have been any more transparent for it. LP terminology and structures have been used here as a back-drop, in order to facilitate the presentation of complex relations within word-formation processes; this does not mean that I agree with every detail of the theory as it stands today.

1.3 Root - Stem - Word: Definitions

“We can quibble over whether people store roots or stems or processes or constraints or whatever, but the central fact remains unchanged: the basic pairing of signal to meaning in any language is completely idiosyncratic and memorised.” (Golston and Wiese, 1998:166)

It may seem strange to start off with such basic issues as the definitions of the apparently well-established entities of ‘root’, ‘stem’ and ‘word’. Based on observations in the previous section, however, it is apparent that if stratal distinction is to be founded on these categories, they need to be well defined. Throughout this discussion of the terminology it is important to keep this end goal in mind; the definitions aimed at here will follow closely those proposed in Giegerich (1999:72ff). According to this approach, a ‘root’, for example, is any base form which undergoes any kind of process on stratum I, before it leaves this stratum; it may already have the appearance of a ‘stem’ or a ‘word’, but while it is on the root stratum it is still regarded as a root. This is an important factor in the following considerations, as it goes against most definitions of what a ‘root’ is (namely, for most linguists, the ‘atom form’ of an entry).

‘Word’, for the purposes of this study, will be defined as a minimum free form⁵ (contrary to ‘roots’ and ‘stems’ which may both be bound), which **must** have a lexical category (unlike roots). A ‘word’, therefore, can be said to be a ‘root’ as well as a ‘stem’ (in German), while a ‘root’ or a ‘stem’ is not necessarily a ‘word’. This notion of ‘word’ contrasts with ‘lexeme’ (cf. e.g. Aronoff (1994:7) who defines word as a free form, and lexeme as a potentially bound stem (*contra* Matthews (1991), Katamba (1993) and Bauer (1994), see below), a term which will not be used here.

Matthews (1991) discusses three distinct senses for the term ‘word’: the sound form of a word, the grammatical word, and the lexeme: “... a lexeme is a (potential or actual) member of a major lexical category, having both form and meaning but being neither, and existing outside of any particular syntactic context. ... A *grammatical word* is a lexeme in a particular syntactic context, where it will be provided with morphosyntactic features (like case and number) ...” (Matthews, 1991:11). Both Katamba (1993) and Bauer (1994) define ‘lexeme’ similarly, but ‘grammatical word’ is interpreted simply as a lexeme with a word

⁵ Bloomfield (1935:156).

category, while the lexeme in a syntactic context is called a 'word-form'. Bauer (1994) uses the term 'word' on its own to encompass all three notions, so as to allow for broader generalisations. In view of the analyses which will be undertaken particularly in chapters III and IV, the term 'word' in this study will represent what Matthews (1991) terms 'grammatical word', rather than any of the variations that are suggested elsewhere.

Looking through a variety of current morphological textbooks, it becomes apparent that there is by no means a consensus on how definitions on 'root' and 'stem' should be formulated, or even whether or not roots and stems should be interpreted distinctively in the first place. From a historical perspective, the evidence from Old English and Old High German seems to point towards a (visible) three-way distinction in the typological status of word formation; namely root-based, stem-based and word-based (Kastovsky, 1990:206). If, therefore, root and stem were non-distinct, as I will argue later e.g. for ModE, the question arises of how this development came to pass - and also, which of the categories became 'redundant'. However, there seem to be a number of arguments which suggest that it would be very useful indeed to *a priori* keep these two categories apart, and define their parameters carefully. I will give a brief survey of some suggested definitions and usages, followed by an amended version of these definitions.

Wilmanns (1896:8) defines 'root' like this:

“Der Teil des Wortes, welcher nach Abscheidung aller Bildungselemente übrig bleibt, nennt man die Wurzel des Wortes. Die Wurzeln sind also das Ergebnis wissenschaftlicher Kritik, sie sind die einfachste Form des Wortkernes, die wir durch Vergleichung erreichen können. Daraus folgt aber nicht, dass sie überhaupt die einfachsten und ursprünglichsten Sprachgebilde waren, auch nicht, dass sie in der durch die Analyse erreichten Form selbständig existiert haben.”⁶

⁶ 'That part of the word which remains after all word-forming elements have been removed is called the root of the word. Roots are therefore the result of scientific analysis, they are the most simple form of the 'kernel' of a word, which we can achieve through comparison. From this, however, it does not follow that they were the simplest and most original entities of language, nor that they existed self-sufficiently in this form, which has been achieved through analysis.' [N.b. Throughout the thesis, all

This very early definition still describes very accurately what roots are: they constitute, in a way, artificial products of our analysis of words, after all else has been stripped away. It is echoed as recently as e.g. Aronoff (1992:15): “A root is what is left when all morphological structure has been wrung out of a form.” Saussure, too, defines a root as the “irreducible element common to all the words of one family” (1983:184). He adds that the root of a word is a “reality” which speakers of a language may recognise, i.e. is not merely an abstract product, but a psychologically real entity. This idea is echoed in Golston and Wiese (1998):

“We feel that our results argue for the reality of the root as a linguistic category. Emphasizing that at least some of the properties are not those which typically hold for the syllable, stem or word, we feel justified in concluding that our study provides evidence for the reality of the root in the phonology and morphology of German.” (Golston and Wiese, 1998: 185)

This may not necessarily be so in all cases, e.g. where language development has lead to an obscured history which renders the status of the original root unrecognisable. Saussure also observes (1983:185): “In certain languages, specific features make speakers aware of roots. This is the case in German, where the root tends to take a regular form. It is nearly always monosyllabic (e.g. *streit-*, *bind-*, *haft-*, etc.) and conforms to certain rules of structure.” This observation, too, is put forward in the study by Golston and Wiese (1988), see below.

For English, Bloomfield (1935: 240) draws the distinction between ‘primary root words’ such as *boy*, *run*, *red* (i.e. ‘free roots’) and ‘primary words’, which are said to contain a bound root and a ‘primary affix’, e.g. *hamm-er*, *spid-er*, *bott-le*, *yell-ow*. It remains to be seen whether or not such an analysis yields any advantages at all over one which would simply consider these items as morphologically simplex forms. At the very least the psychological reality of such an analysis would have to be questioned; and the problem is similar to e.g. wondering if the individual speaker recognises *nat* as the common root in

German quotations are left in their original version in the main text, and my own translation is provided in a footnote.]

nature, natural, innate. Presumably even the categorisation of such items, and the question of how many affixes can be stripped away, is also speaker-specific.

Matthews (1991)⁷ offers a variety of alternative definitions, which mainly appear to be motivated by the framework in which they are put to use: with the focus on inflectional morphology, Matthews distinguishes the (morphologically) **simple root** *volv-* from the (morphologically) **complex root** *volubil-* “which is morphologically ‘derived’ from the base *volv-* by the ‘derivational element’ *-bil-*.” (1991:40). Matthews points out that in many linguists’ view, the first item is what is traditionally perceived as a root, namely an inflectionally as well as derivationally unanalysable minimal unit, while the second item, which may be derivationally analysed, is often called a stem. In other words, to refer to a category ‘stem’ is often seen as useful only when the analysis seeks to distinguish between inflected and uninflected items: Stems are referred to as those items to which inflectional affixes may attach. Traditionally, the interpretation of ‘root’ implies that the unit cannot be morphologically complex (see also Katamba, 1992:45).

This is essentially also the stance taken by Bauer (1983). Roots are defined as those units that are not further analysable, while stems are “of concern only when dealing with inflectional morphology” (1983:20)⁸. Thus in the example *un-touch-able-s*, *touch* is the root, while *untouchable* is the stem. The same interpretation is applied by Thomas-Flinders (1983:111): “We take word to be the form that can be inserted directly into the syntactic structure and the stem to be a pre-inflection form. If the stem is underived, then it is equivalent to a root, if it has undergone some derivational process(es), then it has its usual interpretation.”

⁷One of the great advantages of Matthews (1991) is that he illustrates his definitions of roots and stems with Latin examples. In this highly inflected language, the distinction between roots and stems is visible and necessary (cf. *am(a)*_{Root}-(*nt*) vs. *amaba*_{Stem}-(*nt*)), something which cannot be said e.g. for English (cf. *pack-(ed)* vs. *pack-(ing)*).

⁸Bauer also discusses the notion of ‘base’, the general term for any item to which other elements attach to, i.e. roots, stems and words. I use the term ‘base’ in exactly the same way.

These definitions of ‘root’ and ‘stem’ are useful inasmuch as they capture one very broad generalisation about the main distinction between the two categories (assuming for the moment that they are distinguishable in the first place): roots are the atoms, i.e. they cannot be analysed any further, while stems have undergone some kind of (derivational; here in the sense of ‘stem-forming’) process to make them more complex than roots. The interpretation of the category ‘root’ as it is used here will differ from this definition inasmuch as it allows for roots to be a **recursive** category, i.e. be morphologically complex if and only if this complexity is a result of processes which have occurred on stratum I (cf. Giegerich (1999:73)).

There are two interesting questions which arise from these definitions: First, on what grounds can we decide that the so-called ‘derivational’ elements (Matthews, 1991:40) (example: *-bil-* in *volubil-*, see above) are actually ‘derivational’? The issue here is the fundamental difference between derivational and inflectional morphology (which is addressed in I.4 below); while derivational morphology may affect the semantics of the item (e.g. *ambiguous* - ***unambiguous***; or through a change in word-class, *ambigu-ous* - *ambigu-ity*), inflectional morphology only affects the ‘form’, i.e. clarifies the syntactic function of the item. By calling *-bil-* a ‘derivational’ element, Matthews therefore claims that it does more than simply specifying the form for, say, a tense, e.g. in *am(a)_R-* (\Rightarrow *amas* 2nd Sg. Pres. Ind.) vs. *ama-b_S-* (\Rightarrow *ama-b-is* 2nd Sg. **Fut.** Ind.)⁹. In the chosen example, this actually does work because *-bil-* indicates a change from the (non-lexical category-) root entry to an item which now bears a lexical category, adjective, **but which is not yet a free form**. The distinction is however not all that clear in every case; and the issue in German of e.g. whether or not *-e* in *Aff-e* is essentially a noun-forming - and thus derivational - affix

⁹It may well be argued that the simple fact that the stem is here specified for a **tense** simultaneously (and implicitly) suggests that the form **to which it attaches** must therefore carry the lexical category **verb**, since only verbs can carry tense in Latin. Since roots are by their very nature not specified for a lexical category yet, this is somewhat problematical.

(compare *Äff-chen*), or rather the Nom. Sg. affix, i.e. inflectional will be taken up again below.

The second issue raised by Matthews' and Bauer's definitions is that they pre-suppose that roots do not have a lexical category specification, while stems do - by definition. If stems are said to be further analysable in derivational terms, it is implicit that what distinguishes them from roots must be a derivational affix - which in turn implies a category change; or rather: the existence of a lexical category in the first place. Even though this may not actually be visible (*cat* can be root, stem or word), this marking for lexical categories seems to be inherent in 'stem'. The difficulty now lies in testing this highly plausible explanation against the facts: Are there any such **visible** derivational elements in English or German?

Other morphological textbooks such as Carstairs-McCarthy (1992) make no distinction between 'root' and 'stem' whatsoever: Carstairs-McCarthy uses the term 'stem' when discussing his own approach, and 'root' when assessing Siegel's (1979) findings. This only seems to illustrate the reigning confusion about the terminology - which in turn is based on the lack of convincing evidence as to the grounds on which this distinction could be made.

Nida (1946) deviates quite significantly from the now predominant notions of what constitutes roots and stems. He proposes a three-way distinction into (1) potentially free forms (*boy-ish*), (2) actually free forms (*boy*) and bound forms. Nida (1946:82f): "Roots constitute the nuclei (or cores) of all words ... All bound roots are stems, but not all stems (they are all bound) are roots. A stem is composed of (1) the nucleus, consisting of one or more roots or (2) the nucleus plus any other nonroot morphemes, except the last 'structurally added' morpheme¹⁰ that results in a word."

¹⁰ Morpheme, in this study, will be taken to mean the smallest, indivisible, abstract unit of semantic content or grammatical function (cf. Katamba (1993:20). A morpheme is "... the single minimal or primitive unit of grammar, the ultimate basis for our entire description of the primary articulation of language." (Matthews, 1991:78).

A similar instance of ‘deviation’ can be found in Kastovsky’s (1990, 1994) interpretation of these issues. Stem is defined as “a word-class specific lexeme representation stripped of inflectional endings, but it may contain stem formatives or genuine derivational affixes” (1990:208, 1994:138). Root, still in accordance with Matthews, Bauer etc. “is the element that is left over when all derivational, stem-forming and inflectional endings are stripped away.” So far so good; but the definition continues: “Such roots can **either** be already affiliated to a particular word-class, or they may be word-class neutral, the word-class affiliation being added by a word-formative process” [my emphasis]. It is at this point that the definition for root **within Lexical Phonology** differs: in LP, all roots are unspecified for lexical category - and all forms, at one point or other, are roots, namely when they are on stratum I. This means that even morphologically complex items like *national*, or simplex forms such as *cat* are, as long as they are on stratum I, regarded as roots. That this is neither the most efficient, nor the most psychologically convincing solution must be obvious. (It is also posing added difficulties for analyses of a different kind: e.g. the claim that adjective-forming *-al* attaches to nouns. In LP, this process must be sited on stratum I because of TSS, which means both *nation* and *national* are category-free roots at that point.) For the analyses which will follow, the issue of whether or not roots carry lexical category information is of no consequence. However, the fact that stems are specified for lexical category is absolutely crucial, particularly the verb stems which are the input to certain word formation processes which are discussed in chapter II. Whether these stems are themselves derived from another category, or whether the category information is newly introduced does not seem to matter, as far as I can see. It is only of importance that they are verbs.

Wilmanns (1896:15) states:

“Auch die Wissenschaft kann oft nicht ergründen, wie ein einzelnes Wort thatsächlich entstanden ist, ob es von einem Nomen oder Verbum ... abgeleitet war, und die Frage ist, sobald erwiesen ist, dass mit dem Suffix Ableitungen

sowohl von dieser als von jener Wortart gebildet werden können, **überhaupt müssig.**”¹¹

It would appear that such a distinction could only be made on the grounds of a sneak-preview into the syntax (where the specification is of course obligatory), and the resulting inflectional morphology - that is: up-side-down from the approach aimed at here. The fact that stems appear to be crucially specified for lexical categories will hinge on their utility; as the optionality in Kastovsky’s definition suggests, there is no inherent need for roots to carry a lexical category specification - other than the logical assumption that if ordinary words like *dog*, *book*, *shoe* etc. must be called ‘roots’, there is no reason to assume and no need to propose that they are lexical category free.

One recent article (Golston and Wiese (1998)) is very interesting with respect to attempting not so much yet another abstract definition of what a root is, but rather trying to establish certain identifiable **properties** that all ‘typical’ (German) roots have¹²: the study is based on a database of German roots (Ortmann, 1993). Their results are interesting (if not very surprising); they claim to be able to identify an ‘optimal’ shape of a German root (i.e. CVC; 1998:184), while allowing constraint violations to account for other roots with a ‘less optimal’ shape (e.g. CCVC, CVCC etc.)

What is of particular interest to me (with respect to the following analyses of the linking element in chapters III and IV) is the proposed ‘deletion’ of noun-final schwa from the root. Golston and Wiese (1998:168) argue that this schwa cannot be (a) part of the root because it fails to surface in cases where the root is subject to suffixation (e.g. *Häs-lein*, *lieb-lich*)¹³ or

¹¹ ‘Science, too, can frequently not fathom how a word has really come into existence, whether it is derived from a noun or a verb ..., and the question is redundant anyway, as soon as it is proven that a suffix allows derivations from both categories.’

¹² Their analysis is conducted within the framework of Optimality Theory, i.e. they formulate constraints rather than rules, and identify constraint violations as the distinguishing properties of each root.

¹³ Cf. also Wurzel (1984:38). This is the argument that is employed most frequently: /ə/ is absent where diminutive suffixes *-chen* and *-lein* are attached, e.g. *Bienchen*, *Näslein*, *Äffchen*, *Häslein* etc. If

compounding (e.g. *Nas-horn*)¹⁴; (b) a suffix - because it “signifies nothing”; and thus must be epenthetic. However, I found sufficient reason to assume that /-ə/ is more likely to be part of the lexical item. It only occurs in certain classes of nouns: MASC. VI. (*Hase, Junge*) and IX. (*Name, Glaube*), NEUT. IV. (*Auge*) and most frequently in FEM. IV. (*Nase, Farbe*). These examples will play an important role in arguing for the interaction of morphology and phonology within the lexicon in chapter IV below. If /ə/ were here a purely epenthetic vowel, one might assume that it would be more randomly distributed than is actually the case. Golston and Wiese (1998:173) claim that their alignment constraint captures this particular aspect, and that it states adequately that the vowel is, albeit epenthetic, lexically idiosyncratic. Again, it seems an overreaction to the actual occurrence of the phenomenon (as is the case with many of the analyses proposed in Wurzel (1970) and (1984), cf. chapter IV) to state that the root morpheme in German **only** receives the final /ə/ when it is to surface ‘on its own’ (which is the vast majority of occurrences), and does **not** receive the schwa when it is to be suffixed with *-chen* or *-lein* or appear as the first element in a compound; this argumentation loses even more of its power if one considers that the compounding argument is wrong (cf. chapter IV.). It might be more economical to assume that the schwa is in actual fact part of the root, and is deleted in a few instances (prior to suffixation of the diminutive affix).

/-ə/ is not derivational in e.g. *Biene, Kirche, Frage, Nase, Beere, Blume* etc. (FEM IV) because the class also contains numerous examples ending in a whole range of other sounds: *Semmel, Insel, Nadel, Leber, Schwester, Art, Flut, Last, Tür, Uhr, Frau, Frequenz, Kritik,*

the schwa is assumed to be part of the word, then it would have to be ‘removed’ for the attachment of these suffixes. To avoid such an analysis, the alternative would be to interpret the schwa as a suffix which attaches to the noun stem at a later point, so that when the form *Aff-, Has-* etc. reaches ‘attachment of diminutive suffix’, the schwa has not been attached yet, and therefore need not be deleted.

¹⁴ While the first part of this claim is undoubtedly correct, the second part is wrong: cf. e.g. *Naseweis, Nasenspitze* etc., and see chapter IV for many more examples and an in-depth discussion of this particular aspect of compounding. It is true that there are examples where the schwa does not surface in the juncture position of a [[N] _ [N]] compound, but it is also true that there are many more examples where it is retained, and the plural inflection inserted as well.

Explosion, Frisur etc. The presence or absence of the final /ə/ in the first range of nouns from this class therefore makes no difference. The same can be observed in class MASC VI., (*Junge, Neffe, Hase, Laie, Kollege, Affe, Löwe, Pädagoge, Franzose*), which also contains: *Herr, Elefant, Präsident, Optimist, Planet, Bär, Held* etc. To interpret the word-final /ə/ in some of these examples as an inflection, or a noun-forming affix, goes against the evidence from the other half of the data available in either group.

Ruoff (1981)'s database of frequent German nouns contains 1484 instances of final schwa, 19 % of the total of 7863 entries, as analysed in Golston and Wiese (1998:167): "For various reasons, it is unclear whether this final schwa should be regarded as a suffix or not. If so, it is not clear what the suffix marks. If not, it could be seen either as part of the root or as epenthetic material, not belonging to any morpheme." Golston and Wiese admit that making this decision is of great importance to their analysis, and has a crucial influence on the result. They also admit it is somewhat random. One obvious variant is that if one removes the schwa, the remaining 'root' is consonant-final, an overall result that Golston and Wiese are rather keen on, since it confirms the hypothesis of the 'ideal' shape of 'the German Root'. The final decision, namely to disregard the schwa, is based on research by Wiese (1986, 1996a)¹⁵ where it is argued that "schwa is generally a vowel of epenthesis and not an underlying segment" (Golston and Wiese, 1998:168). This is the only remaining argument that Golston and Wiese offer for disregarding root-final /ə/. It is clearly not enough evidence for such an important decision which has numerous consequences, and it is also the wrong kind of evidence, since the sources cited as proof analyse different aspects of /ə/. The real problem here is that the argumentation rests on the assumption that, as it were, 'all schwas in German are equal', which is very obviously not the case, compare the schwas in *Auge* (root final, and of no phonological and morphological consequences), *Junge* (root final, signals difference between noun and adjective) *Badehose* (in the juncture position of a

¹⁵ Wiese (1996a:126) assumes *-e* in *Blum-e* to be noun-forming, ditto *-en* in *Garten, Brunnen* etc. Wurzel (1970 §2.1) also argues *-ə/* is noun-forming (i.e. a derivational suffix).

compound, between verb stem and noun, to signal ‘verb stem’ for the first element - as opposed to *Bad*_{Noun}), *Sterne* (plural inflection), *Ärztbund* (juncture of nominal compound, signalling plural for the first element) etc.; cf. also the systematic distinction between ‘prosodic’ and ‘inflectional’ schwa as discussed in Giegerich (1987).

If we can really assume that word-final *-e* in German nouns is **neither** an inflectional affix nor a word forming affix, but rather part of the root, the next logical step is to propose that there are in fact no ‘visible’¹⁶ noun stems in German (unlike visible verb stems, which are discussed in chapter II). There are, of course, noun stems in the sense that every word contains a stem (in the same way as every word contains a root), but the distinction is not crucial to the existence of the second stratum in German.

Overall, it would appear that there is good reason to assume two distinct categories, ‘root’ and ‘stem’ in German. The following table will demonstrate how the two terms will be used here.

ROOT	STEM
<ul style="list-style-type: none"> • may be morphologically complex, but only as a result of processes which occur on stratum I • may be free or bound • may be recursive • may not need to have a lexical category 	<ul style="list-style-type: none"> • may be morphologically complex, but only as a result of processes which occur on stratum I or II • may be free or bound • may be recursive • has a lexical category
English e.g.: <i>matern-</i> , <i>nation</i> , <i>nightingale</i>	
German e.g. <i>renov-</i> , <i>les-</i> , <i>Nation</i> , <i>fris-</i>	e.g. <i>renovier-</i> , <i>les-</i> , <i>Nation</i> , <i>fris-ier-</i>

As the following chapter will show, there are word formation processes in German which demand such a distinction. E.g. adjective forming *-bar* cannot attach to roots, because it can

¹⁶ By ‘visible stem’ I mean a distinct form, not one which is outwardly identical with either a root or a word, i.e. some kind of intermediate form which contains more morphological material than the root and less morphological material than the word; see chapter II for examples of verb stems.

only attach to a base which carries the lexical specification ‘verb’, and which must therefore be a stem. For example, it will not attach to the root *fris-*, but may attach to the stem *fris-ier*:

$[fris]_{\text{Root}}$	
	$-eur_N + (\text{optional}) -e$
	$-ur_N + (\text{optional}) -en$
	$-euse_N + (\text{optional}) -n$
$[fris]_{\text{Root}} -ier]_{\text{Stem}}$	$+ (\text{obligatory}) -en, -e, -st, -t, -te$
	$-bar$

However, the issue of distinguishing roots, stems and words is inextricably linked to the distinction which has to be made between derivational and inflectional affixes in German, i.e. between word formation (‘creation’) and inflection (‘adaptation of words to fit the syntax’). The difficulty to establish criteria for such a distinction becomes obvious if one considers the shape of some of these affixes; compare derivational $-en_{\text{ADJ}}$ (*golden*) vs. inflectional $-en_{\text{PL}}$ (*Frauen*); $-er_N$ (*Lehrer*) vs. $-er_{\text{PL}}$ (*Rinder*); $-e_N$ (*Liege*) vs. $-e_{\text{PL}}$ (*Tage*) (examples taken from Fleischer, 1974:33).

It is at this point that the argument overall is in danger of becoming circular. One may take the definitions of roots and stems as the starting point, and continue defining other areas accordingly (as I have done here), or one can start with definitions of inflection and derivation and proceed that way. Wilmanns (1896:10) starts with the definition of inflection vs. derivation, and uses as one of the deciding defining properties the fact that derivation always precedes inflection. He is therefore forced to argue: “Dass unsere Pluralendung *-er* **keine** alte Flexionsendung ist, zeigt sich noch jetzt darin, dass sie dem Diminutivsuffix vorausgehen kann: *Kind-er-chen*, *Kind-er-lein*”¹⁷. The fact that *-er* clearly is an inflectional

¹⁷ ‘That our plural ending *-er* is **not** an old inflectional ending can now be seen in the fact that it can precede the diminutive suffix: *Kinderchen*, *Kinderlein*’

ending for many other reasons is not taken into account, because the method of distinguishing inflection from derivation which Wilmanns has chosen does not allow for such a conclusion.

'Stem', as in this definition, is no longer a useful category in English, and all processes in English which have been analysed as stem-based can just as well be analysed as word-based since there is no longer a difference (cf. Selkirk (1982:54)) on word-based plural formation in English). There is therefore no need to keep the category stem, and it is sufficient to distinguish between only two base-types in English, namely roots and words (cf. Ruskiewicz (1997:235)). Kastovsky (1992) proposes that this is a diachronic development which can be observed in English, and which has a variety of potential triggers, e.g. "One of the most noteworthy changes at the end of the OE period and throughout ME, therefore, was the almost total loss of this stem-variability, or at least its loss as a system-defining property, and its replacement by stem-invariancy as a new morphological principle." (1992:298) This change was brought about by the collapse of the OE morphophonemic system (Kastovsky, 1992:382); later variants of the type *sincere* - *sincerity*, *divine* - *divinity* etc. are due to GVS and stress alternations, and **not** a continuation of OE stem variability. Kastovsky (1992:397) suggests that the processes which started in OE mark the beginning of the transition from stem-based to word-based inflection and derivation for the morphology of English, resulting in today's system where all inflectional morphology attaches to free forms, namely words.

Kastovsky (1990:206) observes that the typological status of word formation, i.e. whether it is root-based, stem-based or word-based depends on the inflectional system of the language. If the inflectional system of the language undergoes changes - and the English system has undergone substantial changes since OE - it is unsurprising that the typological status of the morphological processes in that language should be affected to the extent that one of the base-types is lost entirely (cf. also Kastovsky, 1994:135).

Another interesting observation with respect to the discussion of the status of ‘stem’ in German nouns above can also be found in Kastovsky (1990:212ff). The comment concerns the different development of OE verb morphology to that of OE noun morphology: both categories show a differing typological development. While e.g. denominal derivations in OE were already primarily **word-based** (e.g. *fers* ‘verse’ - *fersian* ‘to make verse’; *treow* ‘tree’ - *treowen* ‘wooden’ etc.), verbs were still inflected on the stem, and deverbal derivation was stem-based, too. Kastovsky (1994:142) argues that German morphology shows a similar distinction in that the nominal system is word-based (i.e. based on the Nom. Sg. form, which shows all nouns with equal status), and the verbal system is stem-based (where “ even the semantically least marked form, the infinitive, ... is characterized by an inflectional morpheme.” (1994:143)).

Summing up, the two models of the lexicon, one for English and one for German, therefore seem distinct in that the English lexicon will have two strata, based on the categories root and word, while the German lexicon will have three strata, based on the categories root, stem and word. All root-based processes will be situated on stratum I for both languages, and all word-based processes on the final stratum. German will have the intermediate stratum in addition to this, which caters for stem-based processes; examples for this will be discussed in chapters II and III.

This shape of the model is exactly what is proposed in Giegerich (1999:72ff). As a result, the stratification allows for the ordering of rules according to which **base** form they select for: for both English and German, the inputs to stratum I are roots; the inputs and outputs of all stratum I affixation are roots; and the final cycle on stratum I converts those roots into the next level of morphological category (stem for German and word for English). Stratum II in German then deals with all processes involving stems, and the final cycle again provides

the conversion to the morphological category word, ready for input into the third stratum. Stratum II in English already is the final stratum, so there is no cyclicity, and no other morphological level conversions are required.

Giegerich (1999:74) observes that it may seem controversial that ‘root’ should be regarded as a recursive category; but, as he points out, this is simply based on the fact that roots are situated on stratum I, and since all inputs to stratum I processes are roots, they **have to be** recursive. So, just as e.g. ‘word’ is a recursive category in the attachment of *home*, *homeless*, *homelessness* etc. in that all three items are words (Giegerich, 1999:75), *nate-*, *nation*, *national*, *nationality* are roots, as long as they are still on stratum I. It is only on the last cycle before they leave the stratum that they undergo the root-to-word conversion (Giegerich, 1999:76ff), and are turned into words.

The other differentiation, which may be regarded as less problematical, is the distinction between ‘free’ vs. ‘bound’ forms. As long as any item is on stratum I and undergoes stratum I processes, it is regarded as a root, and whether or not the item is free or bound is “simply immaterial ... in surface terms” (Giegerich (1999:74). The difference between the category root on one hand and both stems and words on the other is that, within the theory of LP, the former does not bear any lexical category information. As will become clear in many exemplifications of this claim throughout the thesis, there is sufficient evidence that this may be one of the distinctions between roots and stems: roots do not need to be identifiable as nouns, verbs or adjectives etc., while for some processes involving stems in German, the information of lexical category provides the trigger for those processes.

The following section, 1.4, will discuss attempts at the definition of inflection and derivation, the topic which has appeared to have close links to the definition of ‘root’, ‘stem’ and ‘word’.

I.4 Inflection vs. Derivation

“One of the most persistent undefinables in morphology is the distinction between derivational and inflectional morphology.” (Bybee, 1985:81)

Why does there seem to be a need to distinguish between inflection and derivation in the first place? At a very primitive level, there is the impression that there should be such a distinction, whether this is based on the intuition¹⁸ that an inflectional 3rd Pers. Sg. -s in English is qualitatively different from a noun-forming -ity, or whether the arguments are more specific. The need to distinguish between inflection and derivation has also been increased by those (generative) theories that require an *a priori* distinction between the two processes (e.g. Aronoff (1976), Anderson (1982, 1988)), because they seek to confine derivation to the lexicon (since it deals with the formation of new lexical items), while inflection must be treated differently on the grounds of its obvious interaction with the syntax¹⁹. Other models have rejected the distinction entirely (e.g. Lieber (1980), Di Sciullo and Williams (1987)). To define rigorously once and for all what distinguishes inflection and derivation however seems impossible; even though the long list of definitions draws the boundaries between the two opposite poles fairly clearly, and the majority of examples actually do cluster around those poles - the number of strays or in-betweens suggests that perhaps such a clear-cut distinction is (once again) impeded by flawed criteria.

¹⁸Cf. Wurzel (1984:40): “Ungleich schwieriger stellt sich die Abgrenzung der Flexionsmorphologie von der Derivationsmorphologie dar, obwohl bei der Sichtung einzelsprachlicher Fakten intuitiv meist relativ klar zu sein scheint, was als Flexion und was als Derivation zu bewerten ist”. [‘More difficult appears the differentiation between inflectional and derivational morphology, even though in viewing the facts in one language it seems intuitively relatively clear most of the time, which is to be judged inflection and which derivation.’] See also Dalton-Puffer (1993:41).

¹⁹Although it could of course also be argued that it is primarily the syntax that defines which word category is required in a certain position in a sentence - and that thus the output of the process of word formation is just as much dependent on (or interactive with) the syntax as is inflection. [*Peter treated Joan with ____* (has to be filled with a noun).]

The main reason for addressing this topic here (before an attempt to outline some of the characteristics of the morphology of the German verb) is that throughout the following analyses, a distinction between inflection and derivation is assumed to exist; and on many occasions judgement as to whether an affix is inflectional or derivational will be crucial. An interesting issue, for example, is whether the verbal suffix *-(e)n* can be classified as the one verb-forming (i.e. infinitive-forming) suffix in German (suggested e.g. in Fleischer (1974)) - and hence derivational, while all other suffixes attaching to the base forms are interpreted as inflectional (e.g. *(ich) geh -e*, *(du) geh -st*, *(er) geh -t*). The main reason for this lies perhaps in the fact that the infinitive appears to be the most readily available form, i.e. the lexicon entry or 'citation' form, which by definition does not carry an inflectional ending. As has been shown in the discussion of lexical category assignment to stems in I.3, a different interpretation (namely that *-(e)n* is also an inflectional affix) demands a reassessment as to at what point exactly the lexical category 'verb' should be assigned - if it were not to be included in the derivational ending *-en*.

For a number of reasons that are discussed throughout this chapter, I find this position no longer tenable in such a way; - would, for example, *-en* in *wir geh -en* (1st Pl. Pres.) be classed as an inflection - and if so, how would it be distinguished from the derivational *-en*? If *-en* was the (derivational) verb-forming suffix, what would be the status of the 'intermediate' *-ier-* e.g. in *fris-ier-en* and its apparent quality to determine the word class as verbal (see also II.4.5 below)? And what about *das Ess-en* - is it to be interpreted as a zero-derived noun from the verbal base, or would the *-en* here be interpreted as a different ending? And most striking of all: while the *-st* inflection signifies 2nd Sg. Pres., it simultaneously also unambiguously defines the form it attaches to as a verb - and would therefore deserve to be called 'derivational'. My aims in the following excursion are to very briefly evaluate the proposed distinctions.

I would like to discuss here briefly some of the main points of distinction between inflection and derivation that have been cited in the more or less recent literature. What may be interesting to note is that all of these criteria are not ‘rules’ in the sense that they are specific and serve to explain the interactions of processes, but may be considered ‘laws’ in that they prescribe the ideal state of affairs in terms of universal ‘guidelines’ which however need not necessarily be adhered to at all times. This issue is also addressed by Prince and Smolensky (1993:198):

“... a law is some sort of functional principle, hard to evaluate specifically, which grammars should generally accord with, in some way or other, to some degree or other; a ‘rule’ is a precise formulation whose extension we understand completely. ... Linguistic theory cannot be built on ‘laws’ of this sort, because they are too slippery, because they contend obscurely with partly contradictory counter- ‘laws’, because the consequences of violating them cannot be assessed with any degree of precision.”

This, as will be shown below, is exactly the point of criticism concerning the inflection/derivation distinction. It is, however, also the beginning of quite a different problem: If one has rules, one also needs the facts to fit them, otherwise the rules cease to be useful. In certain circumstances ‘laws’ may be more useful, because they allow us to capture *tendencies* quite accurately.

(1) There are more derivational than inflectional affixes in a language (cf. Wilmanns (1896:12); Nida (1946: 99)). The group of inflectional affixes has to be limited, because their functions are limited to marking syntactic functions (e.g. indicating object position) or indicating grammatical categories such as gender, number etc. Derivational affixes may be more varied, because they are used on the **creative** side of word-formation, and the more derivational affixes there are, the more ways we have to invent new words. Wilmanns (1896:12) observes that the number of both derivational affixes and roots cannot be determined, but that there are far more roots than affixes: “Aber da sie nicht nur einzeln auftreten, sondern sich miteinander und in verschiedener Ordnung verbinden können, so

giebt auch die beschränkte Zahl die Mittel zu einer sehr beträchtlichen Zahl von Combinationen. Freilich bleibt die Wirklichkeit hinter der Möglichkeit weit zurück.”²⁰

(2) Processes of derivational morphology are situated more closely to the root than inflectional processes (Nida (1946:99); Wurzel (1984:41); Bloomfield (1933:223)). As the dictum above, this is a relational criterion, and consequently not much help if there is a root with no derivational affixes attached to it - this criterion cannot make a distinction on its own, but is merely comparative. Thus it offers no help if there are cases where two inflectional affixes follow each other (e.g. *mild-est-e*) or where a number of derivational affixes is stacked (e.g. *Ein-heit-lich-keit*). Furthermore, as has been pointed out by Wurzel (1984:41), German²¹ offers a number of cases where an inflection appears to be inside a derivation, e.g. *Kind-er-chen*, *löch-er-ig*, *weib-er-haft*, *Fürst-en-tum*, or within a compound, e.g. *Kind-er-wagen*, *Hose-n-boden*. I will return to the issue of whether or not these apparent inflections are indeed that, or whether they merely have the appearance of inflections (cf. e.g. semantic discrepancies: why have a ‘plural inflection’ in *Kinderwagen* - which is for one child?), in the discussion of linking elements, see chapter IV below. On the whole, therefore, it would appear that this particular criterion has no absolute distinguishing qualities, but can only state that if both inflectional and derivational affixes are present in a form, more often than not the derivational affix will be situated more closely to the root than the inflectional affix.

(3) Derivation creates ‘new’ lexical items, i.e. there is a shift in the semantic content, while after inflection the semantic content of the item remains the same²². Thus, there is no drastic

²⁰ [on affixes]: ‘But since they do not occur on their own, but can combine with each other and in varied order, the limited number offers the means for a very large number of combinations. Of course, the reality is left far behind the possibility.’

²¹ So, for that matter, does English: *work-s-department* etc. See chapter V for more detail.

²² This condition (as many others) has been formulated in a much more restrictive way by Ritt (1993:35): “... the derived item must be semantically different from, i.e. typically more complex than its base ... [and it] must also be formally different from, i.e. typically larger than its base.” - The obvious counterexamples, of course, are ‘zero’ derivation and back-formation. Once more, the use of

change in the meaning of the verb in *I scream* as opposed to *he scream-s*, but compare *intentional* vs. **un-intentional**, which are, albeit still related, semantically opposite. Again this criterion has one major flaw: the semantic content of the base remains the same, whether the attaching affix is inflectional or derivational. Thus e.g. in *book* vs. *books* and *nation-al* vs. *national-ity* the meaning of the base is unchanged. Arguably, the difference is one of **word** vs. **word form** (cf. Wilmanns, 1896:9), whereby all inflections create various forms of the same word. The notion is that an inflectional affix does not semantically ‘remove’ the new word-form from the original word as ‘far’ as a derivational affix does, which creates a **new word** out of the original word (which may then, in turn, have various word forms of its own).

(4) Derivation may change the lexical category of the affected item, while inflection never does. This is perhaps one of the most frequently cited distinctions, but again there are problems, depending on one’s acceptance of dual membership affixes; e.g. *-ing* forms in English. Of course, the *-ing* in *he walks - he is walking* is inflectional, whereas the *-ing* in *she paints - it’s a painting* is derivational. Overall, this criterion seems well-motivated and appropriate where nouns and adjectives are concerned, since here the inflections of case, gender, person and number are unambiguously attributed to the lexical categories. More difficulties are encountered with verbs, where a number of inflections which are traditionally attributed to the verb paradigm may result in adjectival or substantival forms (cf. Wurzel, 1984:41f). Even though the majority of counterexamples to the original claim arise from Latin formations (where e.g. *legēns*, the participle based on the present tense verb stem, is used adjectivally), the similarity to problems that may be encountered in German is quite striking; see chapter II below for the discussion of formations with *-ier-* etc. in German. The intriguing inter-relation between **inflection** and the word category has perhaps been best described by Wilmanns (1896:9): “Den Flexionen eigentümlich ist es, dass sie ein

the conditioning ‘typically’ indicates that these definitions are again a matter of degree, and by no means absolute.

festes System bilden, **welches durch den Classencharakter der Wortart gefordert wird und diesen eben dadurch bestimmt**²³ [my emphasis]. This suggests a very strong (circular) inter-relation between both inflection and derivation, whereby an item which e.g. may prove to be eligible for the attachment of all verbal inflections (tense, person, number) can be defined as a 'verb' because of this; but in turn, it can be said that the fact that the item is a verb may be the crucial trigger for its eligibility to take the verbal inflectional endings (as opposed to e.g. nominal or adjectival). E.g. *warn* may be interpreted as a verb, **because** -s, -ed, -ing etc. may attach; but it could also be argued that because *warn* is **stored** as a verb, it is eligible for the verb paradigm.

(5) Obligatoriness (after Greenberg, 1954) is mentioned as the most successful of the distinguishing criteria in Bybee (1985:82): "an inflectional morpheme is a bound nonroot morpheme whose appearance in a particular position is compulsory." In other words, inflectional suffixes are requirements set out by the syntax for a particular item to change/adapt its shape to fit its position in the sentence. Interestingly, this criterion would also serve as an argument in favour of calling the linking elements in [[N] [N]] compounds in German 'inflections', because their appearance is predictable and compulsory (for those constructions that use -e-, -er-, -es- etc. rather than -Ø-)²⁴.

However, derivation may also be obligatory in syntactic requirements (hinging on the particular syntactic theory), e.g. *destroy_V* entering a position where it is head of an NP would have to surface as the noun *destruction* (cf. Chomsky, 1970). A different kind of obligatory appearance of the derivational suffixes can also be observed for bound roots which require a derivational affix in order to become a free form, e.g. *dign_R-ity_N*. The overall problem with this criterion therefore seems to be that obligatoriness applies to both

²³ 'It is a characteristic of inflections that they form a stable system, which is demanded by the character of the class of the word category, and which in turn dictates it.'

²⁴ But other phenomena in the juncture position, like e.g. *Sproßkonsonanten* in *eigentlich*, *wesentlich* etc., which are even more predictable and compulsory than many linking elements, would also under this definition appear as inflections, even though it is quite obvious that this is not what they are.

inflectional and derivational affixes, as well as a number of affixes which are little more than historical residues or phonologically motivated insertions, or both. As a criterion to distinguish between inflection and derivation, it does not seem to work very well at all.

(6) Another criterion which may be of relevance for a distinction between inflection and derivation is what has come to be known as the Lexicalist Hypothesis. It states that the morphological structure of a word is ignored in the syntax, and that syntactic rules may make no reference to it; of relevance is only the word category (cf. Chomsky (1970); cf. also Anderson, John M. (1982)). In other words, the syntax has no access to the derivational, internal structure of a word, and instead inflection (i.e. the presence of any inflection, and the kind of inflection) is crucial for (or perhaps triggered by) the syntax: "Inflectional morphology is what is relevant to syntax." (Anderson, Stephen R. (1982:587)). Sproat (1988:291) cites an example first noted by Postal (1969) to illustrate this: "*Drivers of trucks fill them up with diesel*" vs. "**Truck-drivers fill them up with diesel*".

This sentiment has already been expressed much earlier than in Chomsky, e.g. Bühler (1934:340): "Das [Kompositum] verhält sich im Satzfeld im ganzen genauso wie ein Simplex; alle syntaktischen Relikte in seinem Schoße sind wie verschluckt und bleiben unberührt."²⁵ The only counter-example to this observation I have been able to find is *der Hohepriester* (Nom. Sg.) - *des Hohenpriesters* (Gen. Sg.) 'high priest' (from Dressler, 1987:73).

The overall claim of the Lexicalist Hypothesis is also very interesting with respect to the nature of the linking elements in German nominal compounds. While it is true that the derivational structure of a word is ignored by the syntax, it is of great importance for the insertion of linking elements. That is to say, there is nothing in *nation-al-ize-ation-al-ity*²⁶ to

²⁵ 'The compound behaves like a simplex within the sentence; all syntactic relics are like swallowed up in its lap and remain untouched.'

²⁶ This example is, admittedly, semantically not very transparent.

stop derivational suffixes from attaching on top of one another, ‘blind’ with respect to how many have gone before (not, however, ‘blind’ regarding what **kind** of affixes are preceding them). The linking elements seem to have access specifically to this kind of information, and appear to be sensitive towards the sheer amount of information preceding them: a complex N_1 (either affixed or itself a compound) is not followed by any linking element other than -s. For a more detailed discussion of this phenomenon, see IV.3.13 and IV.3.14

(8) Derivation can apply repeatedly (cf. *Antidisestablishmentarianism*), but inflection is more limited. Also, in derivation, the same rule may apply repeatedly (e.g. *post-post-war* (from Thomas-Flinders, 1983:111)), while similar stacking of inflectional affixes is not possible (e.g. **want-ed-ed*).

(9) A substitution test has been proposed e.g. Aronoff (1976:2); again, this criterion is not altogether unsuccessful, but it is insufficient on its own.

“Eine mit einem Derivationsmorphem gebildete morphologische Konstruktion kann im Satz durch eine Form ohne dieses ersetzt werden, eine mit einem Flexionsmorphem gebildete dagegen nicht”²⁷ (Wurzel, 1984:42).

While overall most of the above discussed criteria aid a distinction between inflection and derivation, (and there are many more than the ones discussed here), it will have become clear that none of them is sufficient on its own, nor are they sufficiently interconnected to be dependent on each other. In effect:

“Zum Abschluß dieser Problematik soll noch einmal zusammenfassend darauf verwiesen werden, daß die Begründungen für die einzelnen typischen Eigenschaften von Flexionsmorphologie, ... , weitgehen unabhängig voneinander sind. Die entsprechenden Charakteristika müssen also keinesfalls entweder alle zusammen auftreten oder aber zusammen nicht auftreten; sie können auch partiell auftreten. Zwischen ‘typischer Flexion’ und ‘typischer Derivation’ gibt es Übergänge.”²⁸ (Wurzel, 1984:50)

²⁷ ‘A morphological construction which has been formed by a derivational morpheme may, in a sentence, be replaced by a form without this derivational morpheme, a morphological construction which has been formed by an inflectional morpheme can’t.’

²⁸ ‘At the end of this discussion, we should note by way of summary that the reasons for the separate typical characteristics of inflectional morphology, ... , are to a great extent independent of each other.’

Within the framework of Lexical Phonology, it is quite obvious that both derivation and inflection should be located in the lexicon. The processes involved in assigning inflection to words may show irregularities and idiosyncrasies which can only be dealt with within the lexicon, and there are some cases (as will be examined in chapters III and IV) where there seems to be interaction between inflection and derivation. However, as has been pointed out frequently (e.g. Lieber (1981)), the actual inflection that is required in each case is determined by the syntax.

Booij (1996) proposes an interesting distinction between what he calls 'inherent inflection' and 'contextual inflection'. 'Inherent inflection' is said to be more similar to derivation, and "more susceptible to lexicalisation" (Booij, 1996:3) in that it is not necessitated by the syntactic environment (though it may be syntactically relevant), e.g. number for nouns; tense, aspect, the infinitive or the participle form for verbs. 'Contextual inflection' on the other hand is true inflection e.g. person and number on verbs agreeing with subject/object; case markers for nouns. This division is very interesting from the point of view of the results of the data analysis in chapter IV: The marked differences in behaviour of the plural markers versus the case markers when occurring after the first noun in a nominal compound is very noticeable, and echoes the division proposed in Booij (1996). There does indeed seem to be a difference between certain types of inflection. Booij's conclusion is that certain types of inflection (i.e. 'inherent inflection') require interaction with word formation, and should perhaps be considered as subgroups of derivation.

Overall, it appears that inflectional systems have a finite structure which can be predetermined, and there is a specific and limited set of inflectional categories; derivation on the other hand is much less rigorously restricted. Inflection causes a grammatical change of

The corresponding characteristics need not at all occur simultaneously, or not occur simultaneously; they can also occur partially. Between 'typical inflection' and 'typical derivation' there are transitions.'

word forms, while derivation leads to a more substantial, conceptual change of the word as a whole. However, of the criteria which have been discussed above, not one stands out as the one and only necessary criterion for the distinction, nor could one of them on its own ever be sufficient. The final division between inflection and derivation is certainly approximated by the criteria, but it seems to be more along the lines of a 'continuum' as proposed e.g. in Bybee (1985), rather than a clear cut distinction between the two processes.

1.5 Storage of inflected and derived words in the lexicon

The last section on preliminary theoretical observations that I wish to make before proceeding with the analysis of data concerns the actual shape of the lexicon: it deals with a brief attempt at envisaging how and where forms and processes may be located in the lexicon. It is interesting to observe that a substantial number of psycholinguistic studies, which seek to determine what kind of affixation can be assumed to be 'listed' in the lexicon and what can not, arrive not necessarily at the distinction inflection vs. derivation (or, for that matter, the distinction 'root' vs. 'stem' vs. 'word'), but at quite a different set of issues: that of **frequency** and **relevance** (e.g. Bybee, 1985). The morphological model proposed there, based on the theory of natural generative grammar, distinguishes affixes as to how (semantically) relevant they are to the bases they attach to, and how frequently a particular combination occurs. The more relevance and frequency can be attested, the more likely it is that the form in question will be listed in the lexicon as a morphologically simple, unanalysable item. This is illustrated e.g. in Stemberger and MacWhinney (1988)²⁹, whose experiments lead them to the conclusion that all irregular inflected forms and very frequent regular inflected forms are stored in the lexicon as morphologically simplex units, while non-frequent regular forms appear to be derived post-lexically.

²⁹Their analysis deals with inflection only.

Stemberger and MacWhinney (1988) quote four different studies to substantiate their claims. The basic question is which lexical items should be listed in the lexicon individually, and which may be listed under the 'heading' of e.g. the inflectional paradigm they belong to. Stemberger and MacWhinney (1988) are trying to establish not only whether inflected items are stored in the lexicon, but also, if they are, in what way. It is e.g. possible to assume that **all** inflected forms are stored in the lexicon as single units, irrespective of whether or not they are regular or irregular forms, and irrespective of whether or not they are frequently occurring forms. Another approach is to assume that no inflected forms are stored in the lexicon at all, but that only bases and rules are listed. This poses no technical difficulties for regular inflection, but irregular inflection needs additional specifications. The third version is a mix of the two more extreme ones above (cf. also e.g. Kiparsky (1982b)), and it is this for which Stemberger and MacWhinney (1988) offer conclusive evidence. According to their findings, at least some of the regular inflected items must be assumed to be listed: frequently used forms may well be stored in their morphologically complex form (as well as their uninflected base form) for easier retrieval.

The four studies discussed in Stemberger and MacWhinney (1988) aim to provide evidence for or against storage of an item in the following way:

“(a) Given storage, units that are of high frequency should be produced faster and more accurately than units that are of lower frequency. [...] Frequency effects derive from storage and cannot differentiate two items if neither is stored. (Of course, if a frequency effect is present it only tells us that high-frequency forms are stored. It gives no information about whether low-frequency forms are stored, since storage is assumed to increase the speed and accuracy of processing **relative** to no storage.)

(b) Given storage, items that are similar will tend to reinforce each other and lead to faster, more accurate performance. [...] This is a form of analogy and has sometimes been termed EXTENDED ANALOGY.”

(Stemberger and MacWhinney, 1988:103; my emphasis)

Any item is regarded as 'high frequency' if its occurrence is more than 35 out of 1 million words, and a 'low frequency' item is expected to occur fewer than 35 times out of 1 million

words (Stemberger and MacWhinney, 1988:104). The difference between a comparatively frequently used inflected form and a comparatively infrequently used inflected form is that between e.g. *ended* and *mended*, whereby the high-frequency form *ended* is expected to be produced quicker and more accurately than the low-frequency form *mended* - provided both forms are stored in the lexicon. According to Stemberger and MacWhinney (1988:103) this is true particularly where a type of error is concerned whereby the uninflected base form is produced, in a context where the inflected form was required; this error is called ‘no-marking error’ and is one of the most common errors occurring with regular inflection in English.

Stemberger and MacWhinney’s first study covers naturally occurring error data (p.104). The data itself is from a corpus of 7220 spontaneous speech errors in natural speech collected by one of the authors. Under investigation are no-marking errors on past and perfect forms of all verbs, with the exception of *was*, *were*, *did* and *had*. The context required either past or perfect tense, the error was the occurrence of the unmarked base form, e.g. *What was it you just sing?* [*sang*]; *That’s what I need to do.* [*needed*]. The verbs were divided into high frequency vs. low frequency as well as regular vs. irregular. The results were as follows (quoted from Stemberger and MacWhinney, 1988:105):

Irregular verbs:

individual frequency	group frequency	No. of errors	rate
low	1735	17	.00980
high	15012	39	.00260

Regular verbs:

individual frequency	group frequency	No. of errors	rate
low	21305	24	.00113
high	16315	11	.00072

The number of errors in each group was divided by the group frequency to give an approximate error rate. As the table for irregular verbs shows, there is a greater number of errors in the group of frequently occurring items, but this is only due to the greater number of occurrences overall. The interesting result from the first table is that 30.4% of errors occur on low-frequency items, which is considerably more than mere chance (estimated at 10.4%). The result from the table of irregular verbs is that "... This frequency effect entails that at least high-frequency irregular forms are stored in the lexicon." (1988:105)

The second table shows that there is a marginally bigger error rate on low-frequency items than on high-frequency items, too; however, the difference here is not large enough to suggest a significant finding. It may mean that at least high-frequency regular forms are stored, but the results do not prove this absolutely. As Stemberger and MacWhinney (1988:105) observe: "... the production of regular forms is so easy that low-frequency forms are not at that great a disadvantage, and there were consequently too few errors in the corpus to detect a significant difference."

Therefore, the second study concentrates in more detail on the frequency of regular forms. This time, a specific test was employed: a list of 40 English monosyllabic verbs was used, all of which ended in either /t/ or /d/; 10 were high frequency, 10 low frequency, and 20 were distractors. They were put in the frame '*was* ____ *ing*', and the subjects were asked to read this silently and then speak out loud the past tense of the verb as quickly as possible.

The results are given below (from Stemberger and MacWhinney (1988:106):

verb type	No. of errors	No. of trials	rate
low frequency	28	700	.037
high frequency	13	700	.017

This time the results are much clearer: the number of errors occurring on low-frequency regular forms is significantly higher, which strongly suggests that at least high-frequency

regular inflected forms are stored in the lexicon. The study does not make any predictions about whether low-frequency forms are also stored, or whether they are produced online.

The third study in Stemberger and MacWhinney (1988:109, my emphasis) discusses so-called ‘gang effects’: “In a gang effect, several words **in the lexicon** that are similar in form reinforce the patterns of phonemes or letters that they have in common.” A gang effect can only be observed if the affected forms are stored in the lexicon. The effect is said to be greater the more phonemes or letters are shared, and the positioning of the shared segments within the item is also relevant. The more members a ‘gang’ group has, the greater the effect will be.

The third study analyses regular verbs which resemble ‘gangs’ of irregular verbs. It is based on three lists of monosyllabic verbs, each containing 16 regular verbs that resemble irregular past tense forms, 16 regular verbs not resembling irregular past tense forms, and 16 unrelated irregular verbs as distractors. The first list consists of examples which share a minimum of three phonemes with the irregular form, e.g. *spank*, similar to *drank*, *sank*, *stank*, and which are therefore most likely to show some sort of gang effect. The second list consists of examples which share 2 phonemes, e.g. *snore*, similar to *wore*, *bore*, *swore*, *tore*; for this group an intermediate gang effect is expected. The third list contains examples which share only 1 phoneme, e.g. *chew*, similar to *knew*, *blew*, *grew*, *flew*, *drew*, *threw*, *slew* (nb. AE pronunciation); this is the group where a gang effect is least likely to occur.

The results of this study are very much in line with what was expected:

“There were significantly more no-marking errors on verbs that resembled irregular past tense forms than on verbs that did not, for those forms that shared approximately 2-3 phonemes with irregular forms. There were also more no-marking errors on regular verbs that shared only 1 phoneme with irregular forms than other regular verbs, but this did not reach significance. [...] In fact, the error rate was almost a linear function of the number of shared phonemes.” (Stemberger and MacWhinney, 1988:109)

The data from the third study contained additional evidence for the claim that irregular forms are stored in the lexicon; it is, however, of greater interest overall whether **regular** forms are stored or produced online. If few forms with regular inflection are stored in the lexicon, there should be no gang effect influencing such forms. The fourth and last study is set up exactly like study two, except that it attempts to determine whether gang effects can be observed where **regular** inflected forms are concerned. To eliminate any influence irregular forms may have, the forms used are in the present tense this time, e.g. *plays* resembling *gaze*. The study tested a list of 90 monosyllabic English verbs, of which 30 ended in /s/ or /z/, and 60 in other segments. Half of all verbs closely resembled regular inflected present tense forms, and half did not. For those that did resemble actual present tense forms, e.g. *cause*, *coax*, *gaze*, *please* etc. an average of 3.3 shared at least 3 contiguous phonemes, and 19.5 shared at least 2 contiguous phonemes. The results of the fourth study are as follows (Stemberger and MacWhinney (1988:111)):

item type	No. of errors	No. of trials	rate
resemblance	36	900	.040
no resemblance	32	900	.036

In effect, the study shows that the error rates are almost identical. Stemberger and MacWhinney (1988:111) conclude:

“Number of shared phonemes and gang sizes thus have no apparent effect. Gang effects are not present ... The lack of gang effect here implies that regular inflected forms are not in general stored in the lexicon. If they are stored in the lexicon, we would have obtained a gang effect. We conclude that speakers use inflectional rules instead, creating regular inflected forms on-line during language production by adding an affix directly to the base form.”

Summing up, Stemberger and MacWhinney’s studies have yielded the following results: the first study resulted in the observation that at the very least high frequency irregular forms are stored in the lexicon (p.105). The second study implies that at least high frequency



regular forms are stored in the lexicon (p.106). The evidence with respect to low frequency regular forms is inconclusive; they may either be produced on-line or stored. The third study deals with regular verbs that 'resemble gangs of irregulars' (p.109f); here the evidence points to the assumption that irregular inflected forms are stored in the lexicon (p.110). The fourth test analyses regular verbs which resemble regular inflected forms (p.111f); they are found not to be stored in the lexicon (p.111).

There also, however, seems to be sufficient evidence from psycholinguistic experiments (see references in Stemberger and MacWhinney (1988)) to support the presence of inflectional **rules** in the lexicon. The storage question of complex items is closely linked to how frequently any complex unit is used; the working hypothesis is that any unit of high frequency should be produced faster and more accurately than a low frequency one. Also, analogy is a factor: "Given storage, items that are similar will tend to reinforce each other and lead to faster, more accurate performance." (1988:103)

If we can assume (and it is important to bear in mind that until further studies have been undertaken, this is still just an assumption) that irregular inflection - i.e. for English, e.g. the irregular past tense - as well as frequently used regular forms seem to be stored in the lexicon (i.e. listed), while most regular forms can be produced 'online' and need not be stored in their complex form, then the storage facilities that are available in the model of the lexicon need to be enhanced. The model as it stands in LP so far has stratum I as the accommodation place for listing; however, this stratum is mainly associated with irregular forms and items of an either high degree of complexity or rarity of usage. What the model seems to lack is a storage facility which caters for frequently used forms, which are regular and require easy access. Whatever the specific characteristics of those forms may be remains rather intangible: Bybee (1988), for example, calls it 'lexical strength'. I shall return to the

topic of storage, and the proposal of a second storage facility which is **not** situated on stratum I in chapter V.

1.6 Summary

Chapter I has offered an introduction into the theoretical background of this thesis. It was explained in 1.2 that the theoretical framework in which the following analyses will be presented is that of LP, cf. e.g. Giegerich (1999). The approach of base-driven stratification which is pursued necessitated the introductory sections 1.3 to the notions ‘root’, ‘stem’ and ‘word’, as well as 1.4 on the possible differentiations between inflection and derivation. 1.5 is added for the sake of issues concerning psychological reality, an aspect of linguistic theory which I believe to be critically important and which is all too frequently neglected. It is suggested that what is required is a multi-tiered lexicon, with storage space for idiosyncratic information as well as an active word-formation component which interacts with, or is motivated by, the syntax. It is further proposed that, ideally, there should be two different kinds of storage facilities; one for storing morphologically complex items in simplex forms on an early stratum, and another for easy access to frequently or recently used or acquired forms (both regular and irregular) on a lower stratum.

The following chapters present analyses of a range of phenomena in both English and German word formation, all of which illustrate the utility of LP as a model. Chapter II will attempt to determine more closely the exact nature, shape and motivation for the category ‘stem’ in German by analysing word formation processes which either result in verbs or which use verb stems as their inputs. Chapter III follows on from this, with a detailed analysis of compound formations of which the first part is a verb stem. One of the most important aspects of [[Vstem] [N]] compounding which is examined is that of the schwa in

the juncture position, and the question is raised whether this is more than mere 'phonological material'³⁰. Chapter IV will extend this analysis to [[N] [N]] compounds, and investigates the nature of the linking elements in the juncture position in order to determine whether there is interaction of inflection and derivation of this kind. Chapter V offers a comparison to the processes and issues surrounding compound formation in English, and will sum up the findings which strengthen the argument that it is reasonable to assume two differently structured lexica for English and German; the English one with two strata based on the categories 'root' and 'word' and the German one with three strata based on the categories 'root', 'stem' and 'word'.

³⁰ E.g. as suggested by Wurzel (1970).

Chapter II: Morphological processes involving German verb stems

II.1 Introduction

This chapter is the first of three in this thesis which will detail aspects of German morphology and phonology. Chapter II deals with predominantly morphological processes involving the formation of verbs, as well as processes which have verb stems as their input - with the exception of compounding of the kind [[V stem] [N]], which is the subject of chapter III. The aim is to offer substantial evidence in favour of the specific model of the lexicon and the affixation base categories involved in it, as has been proposed in the previous chapter. The model of three strata for the German lexicon rests on the fact that there is an intermediate base category in German, between the two category levels which are also available in English, roots and words: stems. Chapter II aims to provide data and analyses which show that there is good reason to argue for the existence of such an intermediate category in German. Evidence provided will concentrate here on verb stems, and the analysis is divided into firstly showing how verb stems are visibly created out of roots, and secondly how verb stems (no other base category is permitted) are required as inputs to certain word formation processes within German morphology.

II.2 offers a brief introduction into word formation processes which result in verbs in general, and reprises the discussion of the previous chapter (I.4) on the issue of inflection vs. derivation. The difficulty of distinguishing derivational and inflectional affixes is related to the difficulty of distinguishing bound roots from another category for bound verbal bases, which must, however, carry the lexical category specification in order to qualify for the attachment of verb inflection. II.3 deals with compounding of the type [[X] [V]]; II.3.1 investigates formations of the type [[V stem] [V]], II.3.2 compares [[N] [V]], [[Adj.] [V]]

and [[Adv.] [V]]. II.3.3 studies [[Particle] [V stem-*en*]] vs. [Prefix [V stem -*en*]] and tries to establish a differentiation between compounds, prefixed forms and phrases based on the data discussed in this section. Section II.4 offers a collection of data of various kinds of verb stem-forming elements: II.4.1 -*el*-, II.4.2 -*er*-, II.4.3 -*n*-, II.4.4 -*ig*- and II.4.5 -*ier*-, -*isier*- and -*ifizier*-. In section II.5, an analysis will be offered which deals with word formation processes which visibly and demonstrably use verb **stems** as their input; II.5.1 will analyse adjective formation in -*bar*, and II.5.2 will analyse noun formation in -*ung*. II.6 is a summary of the findings in this chapter.

II.2 Verb formation

“Die Flexion ist am Verbum reicher entwickelt als an irgend einer anderen Wortart; dagegen hat die Sprache verhältnismässig wenige Formen für die verbale Worbildung.”¹ (Wilmanns, 1896 (Vol.2): 27)

The formation of German verbs appears to be fundamentally different from the formation of nouns or adjectives. One of the striking characteristics of German verbs is that they may only surface as morphologically simplex forms in the imperative singular², e.g. *schrei* ‘scream’, *wein* ‘cry’, *ruf* ‘call’³, while all other occurrences are always either suffixed or otherwise combined (e.g. in compounds) to achieve ‘completeness’.

¹ Inflection on verbs is more richly developed than on any other word category; however, the language has comparatively few forms for verbal word formation.

² And possibly also in the 1st Pres. Sg., where the -(e) may be optional (depending on region and speaker). Verbs which appear to be derived ‘by zero’ from nouns or adjectives that already end in -*en*, e.g. *rahmen*, *röntgen*, *albern* are not different.

³ There is a range of strong verbs which have exceptional formation of the imperative singular, e.g. *lies!* (from *lesen* ‘to read’) or *iß!* (from *essen* ‘to eat’). Here the imperative seems to be related to the second or third persons singular, rather than the first; cf. *ich lese*, *du liest*, *er liest*.

infinitive	a. <i>schreien</i> 'to scream'	b. <i>segnen</i> 'to bless'	c. <i>turnen</i> 'to do gymnastics'	d. <i>sehen</i> 'to see'	e. <i>lesen</i> 'to read'
1st Pres. Sg.	<i>ich schrei-(e)</i>	<i>ich segn-e</i>	<i>ich turn-(e)</i>	<i>ich seh-(e)</i>	<i>ich les-(e)</i>
2nd Pres. Sg.	<i>du schrei-st</i>	<i>du segne-st</i>	<i>du turn-st</i>	<i>du sieh-st</i>	<i>du lie-st</i>
3rd Past. Sg.	<i>er schrie</i>	<i>er segne-te</i>	<i>er turn-te</i>	<i>er sah</i>	<i>er las</i>
Perf. Part.	<i>ge-schrie-n</i>	<i>ge-segne-t</i>	<i>ge-turn-t</i>	<i>ge-seh-en</i>	<i>ge-les-en</i>
Imperative	<i>schrei!</i>	<i>segne!</i>	<i>turn(e)!</i>	<i>sieh!</i>	<i>lies!</i>
Compound _N	<i>Schrei-hals</i>	<i>Segne-fimmel</i>	<i>Turn-schuh -saal -übung</i>	<i>Seh-schwäche</i>	<i>Les-e-saal</i>

The final /ə/ in the imperative in c. is marginally more optional than in the 1st Pres. Sg. of the forms in a., and c.- e. Comparing this with other forms, such as *segne!*, *röntge!* 'to x ray', where the *-e* is obligatory because of the preceding clusters, it can nevertheless be established that in those forms where there is no preceding environment that requires the presence of final *-e*, it is disappearing (cf. the development of word-final /ə/ in Middle English, and the similar fate of the Dative Singular ending *-e* in German, e.g. *dem Kinde* > *dem Kind*). The forms we are left with - 'verb stems' surfacing without any further inflections - may therefore have to be interpreted as accidental syncretisms. The stem changes in d. and e. are irregular, and pattern minimally with other irregular verbs, cf. *stechen* - *stach* - *stich!*; *geben* - *gab* - *gib!*; but: *heben* - *hob* - *heb!* For these examples (see also *essen* and *lesen* in Footnote 3) it is the case that the imperative singular is identical with the verb stem of the 2nd and 3rd person singular, as opposed to the verb stem of the citation form.

As indicated in chapter I (specifically in the section which defines root vs. stem vs. word, I.3) these forms can, within the theory of LP, only be interpreted as stems, because they crucially contain the information of lexical category (which is not available for roots); cf. also Helbig and Buscha (1972:82): "Der Infinitiv (= Infinitiv I Aktiv) wird durch Anhängen

von *-en* an den **Verbstamm** gebildet: *arbeit-en*, *schlag-en*, *komm-en* ... in einigen Fällen⁴ lautet die Infinitivendung *-n*.⁵ [my emphasis]. The compound examples in (1) furthermore show that the inflectional ending *-en* is just that, i.e. an inflection, and not a derivational affix: compounds can be formed on the basis of verb stems alone, e.g. *klammer-n* ‘to attach’: *Klammer-affe* ‘spider monkey’, *-braut* ‘pillion passenger’; *schwimm-en* ‘to swim’: *Schwimm-bad* ‘swimming pool’, *-flügel* ‘water wings’ etc. There are however other examples which are more ambiguous, i.e. where the verb stem is formally identical with, and semantically similar to, the noun, e.g. *tanz-en* ‘to dance’: *Tanz-saal* ‘dance hall’, *-stunde* ‘dance lesson’, or where an additional linking element is required in the formation of the compound: *Les-e-saal* ‘reading room’, *Bad-e-anstalt* ‘swimming baths’. For an analysis of [[V stem] [N]] compounds, see chapter III.

The situation in German is obviously also very different from English, where verbs (just like nouns and adjectives) are free to occur in unaffixed forms (in 1st and 2nd Pres. Sg. and all Pl. forms): *to cry*, *I cry*, *you cry* - but: *he crie-s*. In German, non-affixed forms can be found in those nouns which lack explicit noun-forming suffixes, e.g. *Schmaus*_{MASC} - *Laus*_{FEM} - *Haus*_{NEUT} or *Bein*_N - *dein*_{POSS. PRON} - *klein*_{ADJ} or *Krach*_N - *schwach*_{ADJ} (cf. Fleischer (1974: 314)). A large percentage of nouns (i.e. those without explicit noun-forming suffixes) is therefore formally non-distinct from either other nouns in terms of gender or even other words of different lexical categories. For detail of the German noun paradigms, see Appendix.

Every surfacing verb form therefore, with the possible exception of the imperative singular, has to be morphologically complex; this also encompasses the so-called citation form (the infinitive): “Jedes deutsche Verb erscheint stets in einer deutlich durch ein **zusätzliches**

⁴ E.g. in cases of verb stem forming affixes, see II. 4 below.

⁵ The infinitive (= infinitive I active) is formed by the affixation of *-en* to the **verb stem**: ‘to work’, ‘to hit’, ‘to come’ ... in some cases, the infinitive ending is *-n*.

Morphem gekennzeichneten Verbform: im Infinitiv (*-[e]n*), im Partizip (*-nd*; *ge- -et*; *ge- -en*).”⁶ (Fleischer, 1974:314).

This fact explains why, at the beginning of chapter I, I was so particularly concerned with the distinction of inflectional vs. derivational affixes: it is so far impossible to determine what the exact nature of the verbal endings in German is. Technically inflectional (i.e. signalling the syntactic relations within the sentence) they can perhaps be termed ‘the most derivational of all inflectional endings’ - since they are obligatory in the process of the formation of a ‘proper’ word. Without inflectional endings (and I will now include the infinitive suffix *-en* here) these verb stems are not free forms, whereby the imperative forms appear to be accidental in those cases which do not require further affixation or a stem change. I will however try to show that these inflectional endings are indeed just that, and **not** derivational affixes, and that the lexical category can be determined prior to their attachment - so that the affixes can be interpreted unambiguously as inflectional verbal endings. In fact, as will become clear throughout this chapter, it is essential for verb stems to carry lexical category information; a number of derivational processes require the base to be specified for the lexical category verb, or else they will not be possible.

All this may make it quite surprising that the scope of available processes for word-formation via suffixation - resulting in verbs - is not very wide. Compounding of the kind so frequently found in nouns (of the type [[N] [N]]) is very rare among verbs, and the choice of verbal endings is limited to the inflectional endings *-en*, *-e*, *-st* etc.⁷, while e.g. prefixation is a much more frequent means of producing new verbs.

⁶ ‘Every German verb always occurs in an explicitly marked verb form, which is marked through an **additional morpheme**: in the infinitive (*-[e]n*), in the participle (*-nd*; *ge- -et*; *ge- -en*).’

⁷ I will concentrate on *-en* for conventional reasons, but would like to point out that on rare occasions a word may be predominantly used in the impersonal 3rd Pers. Sg.: *es weinachtet*, *es tagt*, *es herbstet*.

II.3 Compounding of the type [[X] [V]]

II.3.1 [[V stem] [V stem]-en]] and [[V stem] -en] [V stem] -en]]

Compounding between two verbs or verb stems is generally quite rare - and almost exclusively found with weak verbs (Wilmanns (1896:27)). The few examples that are cited in Fleischer (1974: 306f) are mainly found in literary sources (or as a part of a specifically made-up technical jargon), e.g. *fluchbeten* 'to curse-pray', *grinskeuchen* 'to grin-gasp'; *fließpressen* 'to flow-press', *mähdreschen* 'to reap-thresh (combine)'. These examples appear to be 'near dvandvas', a compound type which is far more productive in nouns or adjectives, e.g. *nordwest* 'north west', *grüngelb* 'green-yellow'.

With Fleischer's examples, however, it is interesting to observe that the two compound elements are structurally not completely on equal terms (although they seem to be so semantically): the first element is the uninflected verb stem, and not the infinitive, i.e. not a free form, cf. **mähendreschen*. The simple fact that the infinitive ending *-en* is not obligatory (and indeed a very rare occurrence for verbal dvandva compounds) on the first base of a [[V] [V]] compound indicates that the verb stem carries sufficient information to facilitate the compounding - namely the information of a lexical category (verb).

What can be found more frequently however is the copula form⁸ (**not** a dvandva) of two infinitives, e.g. *kennenlernen*, *sitzenbleiben*, or participle II and infinitive: *verlorengehen*, *bekanntmachen*, *gefangennehmen*⁹. There are also a few examples which are potentially semantically ambiguous, and are separated by distinct spellings; cf. *sitzenbleiben* 'to retake (a year in school)' vs. *sitzen bleiben* 'to remain seated'. The German spelling reform (cf.

⁸ Whether or not the lexical status of these formations can be identified as 'compounds' or as 'verb phrases' is questionable, since criteria like stress or separability (cf. also II.3 below) do not resolve the problem. The arising difficulties are rather similar to the ones in English, which are discussed in detail in chapter V.

⁹ There is at least one example of two verb infinitives combining to form a noun: *Hörensagen* 'hearsay'.

Heller, 1996) seeks to abolish these differentiations; the original criterion was that the literal interpretation of the item should be spelt in two words, while the figurative meaning would be classified as a compound and spelt in one word¹⁰. However, there are some counter-examples (which is why the reform now advocates the separate spelling of all such formations), e.g. *im Bett liegenbleiben* (lit.) ‘to stay in bed’ vs. *mit einem Plan badengehen* (fig.) ‘to come a cropper’. Thus *radfahren* will be written as *Rad fahren* ‘to ride a bike’ (in analogy with *Auto fahren* ‘to drive a car’). For further examples, see II.3.2 and II.3.3.

Another criterion to distinguish between different kinds of compounding and affixation (particularly prefixation, cf. II.3) is the question of whether or not the forms separate in various inflections (Wiese, 1996a:295ff), e.g. for different person or tense: *ich habe ihn kennengelernt* ‘I have got to know him’, *er nahm ihn gefangen* ‘he arrested him’, *es ist verlorengegangen* ‘it got lost’; or in *zu* infinitives: *kennenzulernen*. The first part of the formation is taken as an unchangeable whole (cf. also below examples with nominal or prepositional bases), while the second part is inflected as a verb¹¹, and separated from the first. One of the main requirements for separation is that the first base obviously has to be autonomous, i.e. it must possess a lexical category, and be a free form. (This does not, however, work the other way round: if the first base is a free form, it does not necessarily mean that it can be separated, e.g. *übernehmen* cf. II.3.3. Comparing this to the dvandva examples above, the difference that can be observed is that the dvandvas are not only semantically, but also structurally much more strongly linked with each other than the copula formations (cf. below examples of verbs derived from noun compounds).

This issue is also related to stress; and a distinction is often made between separable particles (in formations where the stress is initial, i.e. on the particle) and inseparable prefixes which are unstressed. As pointed out e.g. in Giegerich (1985:164), the stress

¹⁰ Presumably this is based on the notion of compounds being somehow ‘more concise’ than phrases, cf. Jespersen (1965:137); for a detailed discussion of the definition of compounds, see chapter V.1.

¹¹ Sometimes both parts are inflected, e.g. *er hat ihn gefangen genommen*.

placement can however not be taken as the infallible signal of whether separation is possible or not (cf. also a small number of examples where the base is already a compound, and therefore - despite initial stress - inseparable: *ohrfeigen*¹² ‘clip round the ears’ - *hat geohrfeigt* etc.). The criterion of separability will be revisited repeatedly throughout the different sections of this chapter; the general picture that emerges is that most verbal compounds (or phrases) seem to be separable, while other formations may not be, or, in some cases, cannot be separated.

II.3.2 [[N] [V stem-en]], [[Adj] [V stem-en]] and [[Adv] [V stem-en]]

It is, on the whole, extremely rare to find nouns or adjectives as first elements in verb compounds; the majority of examples appear to be phrases rather than true compounds, e.g. *danksagen* ‘to thank’, *haltmachen* ‘to stop’, *schlittenfahren* ‘to sledge’, *sackhüpfen* ‘sack race’, *gewährleisten* ‘to guarantee’ etc. The other half of examples are what Marchand (1969:22) terms ‘synthetic’ compounds, i.e. compounds which contain a verbal element in B, which is further derived, e.g. *[[schauspiel]er]n* ‘to act’, *[[wetteifer]n]* ‘to vie’: *er schauspielerte*, *hat geschauspielert* (**schaugespielert*). Note that these examples have a different bracketing from the ones above, and are not separable - but again, this is highly idiosyncratic.

Some examples in this class have been grouped under the heading ‘pseudo-compounds’ (e.g. Fleischer, 1974:316) inasmuch as they are only ever used in the infinitive form or participle II: *notlanden*, *schutzimpfen*, *lobpreisen*, *hohnlächeln*; *notgelandet*, *schutzgeimpft*. They are separable, and thus appear to be similar to the type *schlittenfahren* above, but compare: *ich fahre Schlitten* vs. **ich impfe Schutz*. Similarly structured are *lustwandeln*, **lustgewandelt* ‘to stroll’, **er wandelte Lust*; *wehklagen* ‘to lament’.

¹² Cf. also *bildhauern*, *frühstücken*, *fachsimpeln*, *schriftstellern*, *argwöhnen*, *langweilen*, *weihnachten* (as in ‘*es weihnachtet*’); all of which should probably be regarded as highly exceptional, and therefore listed, root compounds.

Adjectives, however, can be found more frequently than nouns as first elements in compounds with a verb as the B element; Mater (1989) e.g. has 80 examples with an adjectival base - compared to 35 with a nominal base. As in the examples with nominal bases cited above, these compounds will split for the purpose of 'inflection' (i.e. the adaptation into the syntax), for the formation of the tenses (except for the infinitive and participle I forms). Examples from Fleischer (1974:309) are *blankbohnern* 'to polish', *brachliegen* 'to lie fallow', *breititreten* 'to spin out', *dichthalten* 'to keep one's mouth shut', *großziehen* 'to bring up', *richtigstellen* 'to correct', *wundliegen* 'to get bedsores'.

Again, there are some exceptions: *wahrsagen* 'to tell fortunes', **gewahrsagt**, **er sagt wahr*; *liebkosten* 'to caress', **lieb-ge-kost*, but: **geliebkost**, **er kost lieb*. These exceptions are highly idiosyncratic and their origins obscure; perhaps in the case of *liebkosten* even more so, since the stress is here (exceptionally) on the verb (cf. Giegerich, 1985:165ff) - which in itself could be a matter of debate, see e.g. Wiese (1996a:90) who argues for the existence of both stress patterns.

A 'rule' has been proposed to deal with this pattern (Anderson, 1992:282f): if *liebkosten* carries initial stress (like '*wahrsagen*'), *ge-* can attach to the stem to form *ge'liebkost*; if the form is pronounced with final stress, the participle will be **without** *ge-*: *lieb'kost*. Another example where the rule 'initial stress = *ge-*' attachment does not seem to apply is the example *mißverstehen* (cf. Giegerich, 1985:178), see also II.3.3 below.

Examples from Fleischer (1974: 310) on Adjective/Adverb - Verb compounding: *bloßstellen* 'to expose', *stattfinden* 'to take place', *teilnehmen* 'to take part', *achtgeben* 'to pay attention', *fernsehen* 'to watch TV'. These compounds will be separated in all other forms (apart from infinitive and participle I), i.e. present, perfect, past tense, passive, participle II

etc.: 'Er kam **mir** entgegen.', 'Er war mir *entgegengekommen*'. This holds for all the above examples: the main stress is word initial, and the form is separable (e.g. Giegerich, 1985, Anderson, 1992).

II.3.3 [Prefix [V stem -en] vs. [[Particle] [V stem-en]]: prefixation, compounding or phrasal verbs?

The issue of prefixation (e.g. *zerstören*) vs. 'compounding' (e.g. *aufsagen*) of verbs can be considered according to a number of criteria:

- (1) What is the nature of the prefixes/particles; i.e. can they be said to belong to a lexical category or are they bound forms?
- (2) Is the resulting item a 'prefixed form', a 'compound' or a phrasal verb?
- (3) Is the resulting semantics of the form compositional or non-compositional?
- (4) What is the behaviour of the 'affix' in various syntactic and morphological variations of the item? (i.e. the issue of separability)
- (5) Is the prefix/particle or the verb carrying the main stress of the item?

In order to approach these issues, I adopt a distinction proposed in Stiebels and Wunderlich (1994) as a working hypothesis, namely that of prefix verbs vs. particle verbs¹³. The two categories are distinguished there initially according to their 'property of separability' (1994:913), which is said to determine both their morphological and syntactic behaviour. Separability simply means that the prefix/particle can either become completely detached from the verb it combines with (see examples from Paul, (1920:33) below), or it can become separated by *-ge-* or *-zu-*. Separability can be found in instances of participle formation, e.g.

¹³ Stiebels and Wunderlich (1994:921) class as 'particles' also nouns, adjectives and verbs, alongside the prepositions discussed here. It is also emphasised (1994:962, FN7) that nouns, adjectives and verbs are very rare in the [[X] [V]] position. I have therefore decided to deal with these separately above (II.3.1 and II.3.2), and discuss only prepositions parallel to the similar, and sometimes identical-looking prefixes.

past participle¹⁴ *aufgeführt, nachgemacht* vs. *verdrängt, entgangen*; present participle (used adjectivally) *die vorzutragende Rede* vs. *der zu beantwortende Brief*; zu- infinitive *beizustehen* vs. *zu erfassen*.

The initial question is whether or not the resulting formations can be considered to be compounds. Paul (1920:33) observes that verb compounding can be found with prepositional adverbs¹⁵, and it is possible to draw a distinction between ‘festen’ and ‘unfesten Zusammensetzungen’ (‘strong and weak compounding’): “... so daß man jetzt zwischen festen und unfesten Zuss. zu unterscheiden pflegt, die sich auch dadurch voneinander abheben, daß bei den festen der stärkere Ton auf dem Verbum, bei den unfesten auf dem Adv. ruht”¹⁶ (Paul, 1920:33). Furthermore, a strong link between the separable verb compounds and the **phrase** can be detected by comparing the behavioural pattern of the two: “Die unfesten Zuss. unterscheiden sich in bezug auf die Stellung der beiden Glieder nicht von bloß syntaktischen Verbindungen, und es gelten für sie die gleichen Regeln wie für diese, vgl. *er nimmt den Hut ab, nimmt er den Hut ab, daß er den Hut abnimmt, er soll den Hut abnehmen, ich bat ihn, den Hut abzunehmen, er hat den Hut abgenommen*.”¹⁷ (Paul, 1920:33) What is also suggested here is that the fact that these compounds were spelt as one word might have been a manifestation of the fact that the overall meanings of the compound forms may not have been immediately evident from the sum total of the two components.

¹⁴ It needs to be added, however, that the affixation of *ge-* is prosodically conditioned: it will only attach if the first syllable of the element it attaches to is stressed (Giegerich (1985:178), Anderson (1992:282f)). This means that the separability criterion, as far as the past participle formation is concerned, constitutes a pseudo-argument, in that it pre-supposes the stress argument, and would not apply without it. The same sensitivity to metrical structure incidentally also influences the formation of *Ge-* ... *-e_N* formations, c.f. chapter III. Wiese (1996a:97) proposes an analysis of *ge-* based on the fact that it is followed by a “monopedal phonological word”. I will not enter a discussion of this subject here; for arguments against the notion of ‘phonological word’ in Wiese (1996a) see Isensee (1997).

¹⁵ ‘Prepositional adverbs’ are here discussed as ‘particles’.

¹⁶ “... so that now there is usually a distinction between strong and weak compounding, which can also be differentiated in that for the strong [composition] the main stress rests on the verb and for the weak on the adverb.”

¹⁷ ‘Weak compounds cannot be distinguished from mere syntactic conjunctions with respect to the placement of their parts, and the same rules apply to both; cf. *he takes the hat off* ...’

Paul's examples otherwise emphasise the failure of separability as a criterion to distinguish between separable particle compounds and phrases¹⁸:

<i>er hat mir etwas davon abgegeben</i> (lit.) 'he has given me some of it'	vs. <i>er gibt sich mit dem Studium der Philosophie ab</i> (fig.) 'he is concerning himself with the study of philosophy'
<i>er hat mir die Last abgenommen</i> (lit.) 'he has taken the load off me'	vs. <i>seine Kräfte haben sehr abgenommen</i> (fig.) 'his powers have diminished'
<i>das Ehepaar hat ein Kind angenommen</i> (lit.) 'the couple have adopted a child'	vs. <i>ich nehme an, daß du Recht hast</i> (fig.) 'I assume that you're right'
<i>er hat einen Brief auf der Post aufgegeben</i> (lit.) 'he has posted a letter at the post office'	vs. <i>der Arzt hat ihn aufgegeben</i> (fig.) 'the doctor has given him up'
<i>er hat das Fleisch den Hunden zur Speise vorgeworfen</i> (lit.) 'he has thrown the meat to the dogs'	vs. <i>ich habe ihm seine Unmäßigkeit vorgeworfen</i> (fig.) 'I have accused him of his immoderation'

In the few instances where even the spelling (pre- spelling reform) varies between one and two words for the infinitive (i.e. the citation form), this distinction usually has semantic consequences which cannot be ignored. Therefore, the spelling e.g. of the lexical item '*freistehen*' 'to be free to do something' in one word has a significance for the semantics of this dictionary entry, which crucially distinguishes it from the two items *frei* 'free' and *stehen* 'stand', which may be combined - but if this happens, the result will have a different meaning from the one that would be derived from the above one-word form. The distinction between the two forms is obvious in all other instances because of their application.

An interesting observation is that the specific verb affixes for the participle *ge-* and *-t/-en* are **always** around the verb proper in such compounds: *dar - ge - stell_v - t*. This may also account for the exceptions cited in II.3.2 above *ge - ohr - feig - t*, *ge - früh - stück - t*, since neither of the internal parts are proper verbs in their own rights, and only the combination produces (marked?) idiosyncratic forms, cf. *übernachten*, *überwintern*, *durchqueren*,

¹⁸ Note that it is not possible in any of these examples to topicalise the preposition, irrespective of whether or not we are dealing with a compound or a phrase; compare **ab hat er mir etwas davon gegeben* and **ab gibt er sich mit dem Studium*. Cf. also English: *off you go* vs. **off you bugger*.

überqueren etc. These forms must therefore be regarded as some rare examples of compound verbs, where the ‘verb’ would not exist outside the compound combination. cf. **nachten_V*, **wintern_V* etc. The influence of the syntax here clearly indicates what is verb and what is not, and treats the forms accordingly - i.e. by splitting off all the non-verbal affixes and inflecting solely the verb form.

The following table sums up the points of distinction between particle verbs and prefix verbs as they appear now. The examples show that some criteria (e.g. that of separability, but also stress) are more successful than others in establishing a differentiation; the least appropriate criterion appears to be that of semantics which posits compositional meaning for particle verbs and non-compositional meaning for prefix verbs.

Particles	Prefixes ¹⁹
Can be separated (both morphologically and syntactically) e.g. <i>auf-sagen</i> , (1) present participle (as adj): <i>das auf-zu-sagende Gedicht</i> (2) past participle: <i>auf-ge-sagt</i> , (3) ‘zu’ infinitive: <i>auf-zu-sagen</i> (4) verb first: <i>er sagt das Gedicht auf</i>	Cannot be separated e.g. <i>zer-stören</i> , <i>die zu zerstörende Burg</i> <i>zerstört</i> , zu <i>zerstören</i> <i>er zerstört die Burg</i>
Predominantly lead to a non-compositional meaning ²⁰ (?) e.g. <i>'freistehen</i>	Predominantly lead to compositional (literal) meaning (?) (This criterion is not only flawed, but also relevant only for those prefixes that are identical with prepositions) e.g. <i>frei 'stehen</i> (phrase)
Stress is word-initial (i.e. on the particle) e.g. <i>'an-geben</i> , <i>'mit-singen</i> , <i>'nach-ahmen</i>	Stress is on the actual verb ²¹ e.g. <i>be-'eilen</i> , <i>ent-'gegen</i> , <i>ver-'gessen</i>

¹⁹ The psychological reality of prefixes is also evident, cf. Golston and Wiese (1998:179): “The *ge-* and *be-* prefixes no longer contribute to the meaning of the stem, but native speakers may recognize them as prefixes.”

²⁰ Just how vague this notion is may be illustrated in an example: *umziehen* ‘to get changed (*refl.*)’ and ‘to move (house)’. At first sight this seems to be a counter-example for the above claim, because I would find it hard to determine which meaning is the ‘more literal’, or indeed, whether there is a stress distinction (which is, interestingly, advocated by Duden (1990): *'umziehen* vs. *um'ziehen*). The more natural stress pattern seems to me the initial stress, which would, incidentally, fulfil the claim that the form then must be separated, as the forms (for both meanings) are: *er zieht um*, *ist umgezogen*; *er zieht sich um*, *hat sich umgezogen*.

²¹ Some prefixes may also receive stress, but only if they are followed by a weak syllable, e.g. *mißverstehen*.

Can only be free forms e.g. <i>an-</i> , <i>ab-</i> , <i>mit-</i> , <i>nach-</i> , <i>vor-</i> , <i>auf-</i> , <i>aus-</i> , <i>bei-</i> , <i>ein-</i>	May, but need not be, bound forms e.g. <i>be-</i> , <i>ent-</i> , <i>er-</i> , <i>ge-</i> , <i>ver-</i> , <i>zer-</i> , <i>hinter-</i>
May be from any major lexical category e.g. 'spazieren _{VERB} gehen, 'rad _{NOUN} fahren, 'kurz _{ADJ} halten	If free form, may only be prepositions e.g. <i>hinter</i> 'gehen, <i>durch</i> 'schauen
'übersetzen	über'setzen
'unterstellen - er stellt ... unter, hat untergestellt	unter'stellen - er unterstellt, hat unterstellt
'umfahren - er fährt ... um - er hat ...umgefahren	um'fahren - er umfährt - hat ...umfahren
'umgehen - er geht ... um, ist ... umgegangen	um'gehen - er umgeht, ist ...umgangen
'umdrehen - dreht um - hat umgedreht	
'umfallen	
'umkommen	
'umkehren	
'durchhalten - hält durch, hat durchgehalten	durch'denken
'durchsagen	
'durchnehmen	
'untergraben	unter'graben
	unter'nehmen
	unter'sagen
dalassen, darstellen	wider'setzen
herkommen	wider'streben
hingeben	über'führen
abfahren, anfahren, auffahren	über'holen
	über'nehmen

The issue of prefixation in verb formation vs. particle verbs seems to be strongly linked to questions concerning the 'visibility' of such formations in the syntax. 'Visibility' here means that information concerning the **internal** word structure is retained after an item has left the word formation component, (as opposed to BEC, the Bracket Erasure Convention, which prohibits such retention of information by erasing the innermost brackets at the end of a cycle) and that such information could be used to explain the subsequent behaviour of an item. For example, if the structure [[particle] [verb]] were still 'visible', rather than the item being simply [verb], subsequent detachment of the prefix could be explained more easily. According to this criterion alone, prefixes and particles actually fall into three major

categories; (1) those that are never under any circumstances removed from the root they attach to (prefixes); (2) those that may be split, but don't have to and (3) those that have to be separated from the root in all occurrences, apart from the infinitive form and present participle (particles). It is the second group which cannot be categorised solely according to the criterion of separability.

(1) *be-*, *ent-*, *er-*, *ge-*, *ver-*, *zer-*, *hinter-* are never split from the base; they are (except for *hinter*) bound affixes that cannot be detached from the root word: *beschenken*, *ich beschenke ihn*, *ich habe ihn beschenkt*; *hintergehen*, *ich hintergehe ihn*, *ich habe ihn hintergangen*. This is also signalled by the stress pattern; prefixes never carry the main stress, compare (2) and (3) below. Other examples for this category are: *voll-*, e.g. *vollbringen*, *-führen*, *-enden*, *-ziehen*, *-strecken*; *miß-*: *mißachten*, *-billigen*, *-brauchen*, *-deuten*, *-glücken*, *-handeln*, *-trauen*; *mißfallen* vs. *gefallen*, *mißlingen* vs. *gelingen*, *mißraten* vs. *geraten*.

These prefixes may also attach to already prefixed forms, e.g. *ver-'voll-kommen*, which again is non-separable (albeit the stress is here on the second prefix). Examples like that are very rare; cf. also *miß-ver-stehen*, *miß-be-hagen*²². The frequently cited (non-standard) exception form '*versteh mich nicht miß*' is also quoted in Paul (1920:38).

(2) *durch-*, *über-*, *um-*, *unter-*, *wider-* can all be used attached or detached (i.e. as particles or prefixes); *über'setzen*_{Trans} 'to translate': *er übersetzt*, *er hat übersetzt* contrasts with '*übersetzen*_{Intrans} 'to cross over (by boat)'²³: *er setzt über*; *er ist übergesetzt*. It is at this point that the distinction of compositional vs. non-compositional meaning may be drawn in to highlight distinctions; there are however so many counter-examples that it would seem

²² But note that in nouns and adjectives the prefix *miß-* always carries stress: '*Mißfallen*', '*Mißtrauen*', '*mißgelaunt*', '*mißvergnügt*' etc.

²³ cf. also: '*durchfahren*' vs. '*durch'fahren*' 'to drive through'; '*untergraben*' 'to bury' vs. '*unter'graben*' 'to undermine'; '*überziehen*' 'to put on' vs. '*über'ziehen*' 'to overdraw' (examples from Giegerich (1985:164, 169).

adventurous to rely solely on semantic aspects. In the case of *über'setzen*_{Trans} vs. *'übersetzen*_{Intrans} the semantic criterion seems inappropriate: *über'setzen*_{Trans}, according to the criteria of stress and separability is a prefixed construction, but the semantics is not particularly literal, while *'übersetzen*_{Intrans} appears to be a particle verb (stress is on the particle and it may be split), with more literal semantics. If anything, these two examples illustrate that the semantic dimension can also be reversed.

The more definitive recurrent pattern seems to be that initial stress co-occurs with separability of the form in all formations save the infinitive, while stress on the verb results in no splits. How tentative these criteria still are can be seen from an account of these examples which is diachronic in nature (e.g. Paul (1920)) and which contains evidence of forms where the separable/inseparable aspect was reversed (e.g. G. Keller, *sein Gesicht überfloß von Thränen*, H. v. Kleist, *welche die Klagen untergeschlagen hatten* etc.; examples from Paul (1920:35)).

(3) All other particles that attach to verbs have to be separated in all forms (except the infinitive), either by the spelling (as different words) or by *-ge-*. Examples for this group contain *an-*, *ab-*, *mit-*, *nach-*, *vor-*, *auf-*, *aus-*, *bei-*, *ein-*, etc. The word stress is here always initial. These particles can be attached to simplex verbs as well as already compounded forms (cf. Stiebels and Wunderlich (1994:925f), e.g. *an-er-kennen*, *auf-er-stehen*, *aus-er-sehen*, *nach-empfinden*, *an-ver-trauen*. Note that some of these specific examples are not necessarily separated, e.g. *obliegen*).

As the above discussion has shown, particle verbs share more properties with compounds than prefix verbs do; but because their individual components are separately accessible by the syntax, and since the particles allow for modification and topicalisation (cf. Stiebels and Wunderlich (1994:952), they are actually closer in nature to phrases than to compounds. It

seems plausible to argue that syntax on the whole does not have access to the separate components of morphologically complex lexical items (e.g. morphological negation is not accessible by the syntax (Stiebels and Wunderlich (1994:959)); A elements in AB compounds do not generally share the case inflection which attaches to the B element (for English and German²⁴)). Since particle verbs are a blatant exception to this claim, it would appear more appropriate to categorise them alongside phrases rather than compounds proper.

For a comparison with English data, and a discussion of the defining properties of phrases and compounds in English, see chapter V.

II.4 Formation of Verb stems

Fleischer (1974:320) writes on what he calls the verb stem ‘extension’: “Aber *-el-n*, *-er-n*, *-ier-en*, *-ig-en* ordnen **nicht** die Wortklasse des Verbs ein, das geschieht erst durch *-(e)n*, das einzige Verbalisierungselement.”²⁵ As will be shown throughout this section, as well as section II.5, this cannot be the case, since some of these elements show an inherent tendency to specify the item they attach to for the lexical category ‘verb’, and the later attaching inflectional suffix *-en* makes no difference to the already established word class. While the immediately following section will merely list the possible verb stem-forming affixes with examples, the subsequent sections on adjective formation in *-bar* II.5.1 and noun formation in *-ung* II.5.2 will present conclusive evidence which confirms the claim: both derivational affixes only ever attach to stems which are identifiably specified for the lexical category verb.

²⁴ The only counter-example to this claim is, as far as I am aware, *der Hohepriester* ‘high priest’ (nominative) vs. *des Hohenpriesters* (genitive).

²⁵ ‘But *-el-n*, *-er-n*, *-ier-en*, *-ig-en* do not determine the word class, that only happens because of *-(e)n*, which is the only verb-forming element.’

II.4.1 -el-

Verbs ending in *-eln* fall into two basic categories; those where the *-el* sequence (syllabic [l]) is part of the root and those which employ *-el-* as a verb stem-forming element. In the examples in (1), the /l/ is part of the root; the noun from which the verb is derived via *-n* is still recognisable. However, even in an example like *um-zingel-n* where the original root is obscured (cf. Mhd: *zingeln*), the /l/ is not the verb stem forming affix.

- (1) *adeln* ‘to make s.o. a peer’
angeln ‘to fish’
hobeln ‘to plane’
runzeln ‘to wrinkle’
stoppeln ‘to glean’
löffeln ‘to spoon’
tafeln ‘to dine’
wurzel ‘to root’
gipfeln ‘to culminate’
schimmeln ‘to go mouldy’
lispeln ‘to lisp’
streicheln ‘to stroke’
verzetteln ‘to waste (time) or get sidetracked’
kitzeln ‘to tickle’

In the following examples in (2) however, /l/ is introduced in the verb-formation process:

- (2) *kränk-el-n* ‘to be sickly, ailing’ (cf. *krank*_{Adj} ‘ill’; *er-krank-en* ‘to fall ill’)
frömm-el-n ‘to be sanctimonious’ (cf. *fromm*_{Adj} ‘pious’)
tänz-el-n ‘to skip / to prance’ (cf. *tanz-en* ‘to dance’)
hüst-el-n ‘to give a little cough’ (cf. *hust-en* ‘to cough’)
läch-el-n ‘to smile’ (cf. *lachen* ‘to laugh’)
tröpf-el-n ‘to dribble’ (cf. *tropfen* ‘to drip’)
bröck-el-n ‘to crumble’ (cf. *Brocken*_N ‘chunk’)
funk-el-n ‘to sparkle’ (cf. *Funken*_N ‘spark’)

The group in (2) has an additional characteristic: most of the resulting formations are of a **diminutive** (and/or ridiculing) nature, while all other forms are verbs which are non-evaluative. As can be seen in II.5.1 and II.5.2 below, this group is **not** eligible for the attachment of *-ung* or *-bar*, but for reasons which are unrelated to the nature of their composition.

II.4.2 -er-

The majority of verbs ending in *-er-n* appear to have been primarily derived from roots already containing that /r/; in those examples the *-er-* cannot be said to be the verb stem-forming element. However, some of those original stems may no longer be recognisable (because the original root became obsolete); e.g. (Wilmanns, 1896 (2):91): (in OHG) *lungern* ‘gierig aufpassen’: ‘to pay attention’ from OHG *lungar* ‘hurtig, schnell’, MHG *lunger*; and *weigern* ‘to refuse’ from OHG *weigarôn*, *weigar* ‘tollkühn, halsstarrig’: ‘reckless, stubborn’. Some examples where the root word (including the /r/) is still readily recognisable are:

füttern ‘to feed’ - *Futter*_{Noun}
ändern ‘to change’ - *anders*_{Adj}
hämmern ‘to hammer’ - *Hammer*_{Noun}
säubern ‘to clean’ - *sauber*_{Adj}
verschwägern ‘to become related by marriage’ - *Schwager*_{Noun}
läutern ‘to cleanse’ - *lauter*_{Adj}
hungern ‘to hunger’ - *Hunger*_{Noun}
feiern ‘to celebrate’ - *Feier*_{Noun}
buttern ‘to butter / to make butter’ - *Butter*_{Noun}
federn ‘to bounce / to fit with springs’ - *Feder*_{Noun}
ab-magern ‘to become thin’ - *mager*_{Adj}
ver-finster ‘to darken’ - *finster*_{Adj}

There are, however, a few examples where the *-er-* is not part of the root and thus may be interpreted as a stem-forming affix:

folg-ern ‘to conclude’ (cf. *folgen* ‘to follow’)
*alt-ern*²⁶ ‘to age’
klett-ern (according to Kluge (1989) derived from *Klette*_N) ‘to climb’
räuch-ern ‘to smoke (e.g. fish or meat)’ (cf. *rauchen* ‘to smoke (a cigarette)’)
schneid-ern ‘to tailor’ (cf. *schneid-en* ‘to cut’); exceptional in that the verb is most likely derived from the agent *-er* form; cf. also *schriftstellern*; ditto: *[[räub]er]-n* ‘to raid’ (cf. *raub-en* ‘to rob’); *imkern* ‘to keep bees’.

²⁶ This example is, according to Wilmanns (1896: 95) historically **not** derived from *Alter*_N, but from *alt*_{Adj}, which does not have the /r/ as part of the root; synchronically, however, it may well be derived from the noun.

There are also a few examples where the base appears to be adjectival (including the comparative ending *-er*)²⁷, the overall meaning of which is ‘to make something more *x*_{ADJ}’, e.g.:

fein, feiner: *ver-fein-er-n* ‘to refine’
vergrößern ‘to coarsen’
vergrößern ‘to enlarge’
mild-ern ‘to alleviate’
erleichtern ‘to make easier’
verschlimmern ‘to make worse’
verschönern ‘to make something look nicer’

Frequently these formations occur only in conjunction with a prefix (but cf. *mildern* and *altern* in the examples above); predominantly *ver-*. One of the most convincing examples is the base *gut* ‘good’; *ver-besser-n* ‘to improve’ where the verb quite clearly indicates that the form is indeed the comparative form of the original adjective (but cf. the semantically distinct *vergüten* ‘to compensate’). That is not to say, however, that this particular process of formation works with all adjectives (not even all those that **can** have a comparative); the corresponding verb lacks the /r/ e.g. in *braun, falsch, hoch, schwach, scharf, krumm, zahm, menschlich* etc: *scharf, schärfer*; but: *schärf-en*. There does not seem to be a pattern according to which adjectival bases select for one or the other verb formation process; both [Adj.] *en*_v and [Adj.] *er* *n*_v seem equally available. Adjectives seem to be listed as to whether they verbalise through the comparative or the simple form.

II.4.3 *-n-*

Examples of verbs ending in *-nen* are much rarer than the instances of *-eln* or *-ern* discussed above. Derived from a noun basis are e.g. *ordnen, regnen, segnen, zeichnen*; from an adjectival base: *ebnen, eignen, öffnen, trocknen* and with an obscured origin: *leugnen, rechnen*. One solution might be to suppose that the roots end in *-n*, and the schwa is

²⁷ There is also a small number of formations where *-er* could be interpreted as a noun plural inflection, e.g. *blätter-n, ver-götter-n, ent-völker-n*; but cf. *zer-trümmer-n* (simplex).

epenthesised according to prosodic description of whether the resulting form is a verb or an adjective; e.g. [ebn]n: *eben*_{Adi} vs. *ebne*_{Verb stem}. This would mean that examples from this group fall into the same category as *fälschen*, *schwächen* above, i.e. the *-n-* cannot be regarded as a verb stem-forming affix, and the examples here are therefore not relevant for my purposes.

II.4.4 *-ig-*

Verbs in *-ig-en* are primarily formed on an adjectival base, e.g.

ver-günstig-en ‘to give privilege to’
kräftig-en ‘to strengthen’
bändig-en (cf. *unbändig*) ‘to tame’
be-lästig-en (cf. *belasten*) ‘to hassle’
be-richtig-en ‘to correct’
ver-ewig-en ‘to immortalise’
be-gnadig-en (cf. Mhd *be-gnâden*) ‘to pardon’

These examples will be disregarded, because it is possible (and indeed very likely) that the *-ig-* is part of the base, rather than a verb stem-forming affix. There are however also a number of examples from predominantly non-adjectival bases, in which *-ig-* is not part of the root, or unlikely to be part of the root. Here, the *-ig-* is not the adjective ending *-ig*: “Verba auf *-igen* haben ihre Endung nicht nach dem Muster von Adjektiven angenommen, sondern nach dem Muster von Verben, die von solchen Adjektiven abgeleitet waren”²⁸ (Wilmanns (1985:15-6):

be-sänft-ig-en ‘to calm’
rein-ig-en ‘to clean’
ver-eid-igen ‘to swear s.o. in’
huld-igen ‘to pay tribute to’
stein-igen ‘to stone’
ängst-igen ‘to frighten’
aus-händ-igen ‘to give out’
ge-nehm-igen ‘to allow’
be-schön-igen (cf. Mhd *be-schönen*) ‘to whitewash’

²⁸ ‘Verbs in *-igen* have taken their ending not from the pattern of adjectives, but from verbs which are derived from such adjectives.’

be-erd-igen 'to bury'
be-glaub-igen 'to certify'
be-seit-igen 'to get rid of'
be-nachricht-igen 'to notify'

Note that a number of these had alternating forms without *-ig-* in MHG; this may suggest a parallel development where *-ig-* became used as a stem_V-forming suffix in the same way as e.g. *-ier-* etc. (see II.4.5 below), though I think that this is very unlikely.

II.4.5 *-ier-*, *-isier-*, *-ifizier-*

Originating from loans of 12th century French, *-ier-* has grown to be the most frequent verb stem-forming suffix in Modern High German. While it was and still is primarily attached to non-native bases, there are also some examples where *-ier-* is used to extend native roots, e.g.

halb-ier-en 'to halve'
buchstab-ier-en 'to spell'
blond-ier-en 'to bleach (hair)'
gast-ier-en 'to give a guest performance'
hof-ier-en 'to court s.o.'s favour'
glas-ier-en 'to glaze' (cf. *Glasur* - a similar formation to English *coolant*)
stolz-ier-en 'to strut'
haus-ier-en 'to peddle'
schatt-ier-en 'to shade'

Wilmanns, 1896 (2):114 calls these unusual combinations of native roots and non-native affixes "Bastardbildungen" ('bastard formations'), and notes that numerous scientists (Grimm among them) were unhappy about the mixture of foreign and native material.

Much more frequently, however, are the verb stem-forming affixes found on non-native bases, e.g.

-ier-: *revid-ier-*, *sekund-ier-*, *erod-ier-*, *fotograf-ier-*, *propag-ier-*, *karik-ier-*, *appel-ier-*, *kalkul-ier-*, *legitim-ier-*, *transform-ier-*, *telefon-ier-*, *kompon-ier-*, *dikt-ier-*, *invest-ier-*, *mut-ier-*, *salut-ier-*, *fris-ier-*, etc.

-isier-: *konkret-isier-*, *privat-isier-*, *rival-isier-*, *signal-isier-*, *bagatell-isier-*, *narkot-isier-*, *hypnot-isier-*, *sympath-isier-*, *koal-isier-*, *demoral-isier-*, *fratern-isier-*, *dramat-isier-*, etc.

-ifizier-: *de-ifizier-*, *qual-ifizier-*, *ampl-ifizier-*, *elektr-ifizier-*, *ident-ifizier-*, *paz-ifizier-*, *myst-ifizier-*, *exempl-ifizier-*, *klass-ifizier-*, *person-ifizier-*, etc.

The group of examples with *-ier-* is vast; examples in *-isier-* and *-ifizier-* (clearly related) are also very frequent. They all attach mainly to non-native bases.

One of the most important observations which needs to be made about this group of data is that *-ier-* etc. form **transitive** verb stems. This particular aspect will become crucial in the discussions in II.5 below, where it is the aspect of transitivity which specifically allows the attachment of certain affixes. This is not only true for those examples where the semantics of e.g. the formation [root] *isier*] (for root = e.g. *steril*, *legal*, *national*) are ‘to make something [root]’, but also for all forms whose base is a bound root, cf. *kollab-*, *produz-*, *(des)infiz-*, *revid-*, *skand-*, *kommand-*, which, via attachment of *-ier*, are transformed into transitive verb stems.

Wellmann (1975:22) organises verbs with these stem formations into those that are ‘derived from adjectives’ (*legalisier-*, *homogenisier-*, *amerikanisier-*, etc.) and those that are ‘derived from nouns’ (*patronisier-*, *katalogisier-*, *kanalisier-*, etc.). To say that these examples are derived from a base which is already specified for a word class is, I think, beside the point; rather it would be more accurate to say that *-ier-*, *-isier-* and *-ifizier-* attach to roots²⁹, which are as yet unspecified for lexical categories: *fris-ier*, *torped-ier*, *konstru-ier* etc. The reason is that too many of the base forms are not identifiable as members of a certain word class at the point prior to the attachment of the affix (e.g. *mut-*, *revid-*, *erod-* etc. above), and others, e.g. *amerikan-* still have the potential to turn into a noun, a verb or an adjective by means of derivational affixation. It is unclear why it should at this stage in the derivation already be specified for ‘adjective’, or any other word class for that matter.

²⁹ Note, however, that root is a recursive category, and that it is quite possible for the inputs to stem-formation to be complex; cf. *de-moral-isier-* or *foto-graf-ier-* etc.

It is in the following section, however, that conclusive evidence in favour of the verb stem-forming nature of such affixes will be given.

II.5 Derivational processes with verb stem inputs

The processes with verb stem inputs which will be discussed in the following sections are adjective formation in *-bar* (II.5.1) and noun formation in *-ung* (II.5.2). Both analyses will provide examples which determine relatively unambiguously the lexical category of the base input. This in turn provides evidence as to whether or not stems carry lexical category specification, which will crucially help to distinguish them from roots. The main aim of this section is therefore to show that the inputs to the two types of word formation processes discussed here are **qualitatively different** from inputs to other derivational processes - and that there is a distinction between roots and stems in German.

II.5.1 Adjective formation: [Verb stem] *-bar*_{ADJ}

“Das Suffix *-bar* ist heute außerordentlich productiv in der Bildung **deverbaler** Adjective”³⁰ (Fleischer, 1974: 251)

The adjective forming suffix *-bar* originally had the form of *-bâri* (*-bârig*) from *bêran* ‘to carry, to bear’, though this meaning is lost in German today. With semantics ranging through to ‘bringing, bearing, causing’, e.g. in *dankbar* ‘thankful’, *haft-bar* ‘liable’ “und ein merkwürdiges *gerichtsbar* in *Gerichtsbarkeit*”³¹ (Wilmanns, 1896: 483), the suffix was productive in OHG, too. However, out of the three different kinds of formations (a) from nominal bases (*dienstbar*, *zinsbar*), (b) adjectival bases (*offenbar*, *lautbar*) and (c) verbal bases (*lösbar*, *nachweisbar*, *kontrollierbar*³²) only (c) is productive in present day German³³.

³⁰ ‘The suffix *-bar* is today extraordinarily productive in the formation of deverbal adjectives.’

³¹ ‘and a strange *gerichtsbar* in *Gerichtsbarkeit* ‘jurisdiction’.’

³² Examples from Toman (1983:66).

Toman (1983:67) observes: “Es erscheint also bereits bei einer synchronen Analyse berechtigt zu sein den Schluß zu ziehen, daß die denominalen und die deadjektivischen *bar*-Adjektive unproduktiv sind, weil sie eben semantisch inkohärente Gruppen bilden, und weil sie mittels geschlossener Listen aufgezählt werden können, zu denen höchstens sporadisch neue Ableitungen hinzugefügt werden können.”³⁴

Two different semantic interpretations are possible with the *-bar* suffix: an active meaning and a passive meaning. In the active interpretation, the noun which is specified by the *-bar* adjective is the subject, while in the passive interpretation the noun specified by the adjective is the object. Examples for the former are e.g. *haft-bar*, *halt-bar*, *gang-bar*, while the various examples for the passive interpretation will be of main concern here. Since the active interpretation is quite rare, it might be appropriate to locate these formations on stratum I (i.e. as listed). Otherwise the attachment of *-bar* to transitive verb stems is very productive as well as transparent, and there is good reason to assume that while the stem formation itself is situated on stratum I, the attachment of *-bar* to verb stems is located on stratum II (the stem stratum).

Comparisons between the various adjectival suffixes are often drawn, and some of the observations that can be made are quite significant for the overall interpretation. Wilmanns (1896:496) for example suggests that *-bar*_{ADJ} is ‘closer to the original verb’ than e.g. *-lich*_{ADJ}, compare: *deutlich* ‘clear’ - *deutbar* ‘interpretable’ (cf. *deuten* ‘to interpret’); *ausführlich* ‘detailed’ - *ausführbar* ‘practicable’ (cf. *ausführen* ‘to carry out’); *erklärlich* ‘understandable’ - *erklärbar* ‘explainable’ (cf. *erklären* ‘to explain’); *sträflich*

³³ In MHG, 46% of new formations with *-bar* were denominal, but only 2% account for denominal *bar*-adjectives in the 20th Century, while the deverbal formation in MHG was 33%, which has now risen to 98% (Toman, 1983:68).

³⁴ ‘Even in a synchronic analysis, it would appear to be justifiable to come to the conclusion that the denominal and deadjectival *bar*-adjectives are not productive, because they form semantically incoherent groups, and because they can be enumerated in closed lists, to which new formations are added only sporadically.’

‘reprehensible’ - *strafbar* ‘punishable’ (cf. *strafen* ‘to punish’); *leserlich* ‘legible’ - *lesbar* ‘readable’ (cf. *lesen* ‘to read’).

It is also interesting to look at a list that compares examples which do not have an equivalent of the other affix³⁵ (examples from Wilmanns, 1896:496):

<i>-bar</i> (no <i>-lich</i> equivalent available); examples are based on verb stems, e.g. <i>glättbar</i> from <i>glätt</i> _{Verb stem} , not <i>glatt</i> _{Adj}	<i>-lich</i> (no <i>-bar</i> equivalent available) possibly root-based?
<i>dämpf-bar</i> - fr. <i>dämpf</i> _{Verb stem} , not <i>Dampf</i> _{Noun}	<i>un-ent-gelt-lich</i>
<i>brenn-bar</i>	<i>glaub-lich</i>
<i>denk-bar</i>	<i>mög-lich</i>
<i>find-bar</i>	<i>leid-lich</i>
<i>trink-bar</i>	<i>un-aus-steh-lich</i> ? <i>-bar</i>
<i>fühl-bar</i>	<i>un-wider-steh-lich</i> ? <i>-bar</i>
<i>hör-bar</i>	<i>üb-lich</i>
<i>reiz-bar</i>	
<i>ge-niess-bar</i>	
<i>an-wend-bar</i>	
<i>her-stell-bar</i>	
<i>er-reich-bar</i>	(!) <i>un-be-streit-lich</i>
<i>be-streit-bar</i>	

It would appear that even though both adjective forming suffixes fulfil similar functions semantically as well as grammatically, *-bar* appears to select almost exclusively transitive verb stems as its base, while the suffix *-lich* is much less restricted in its scope of bases (but also less productive). The following subsections investigate in more detail the exact nature of the verb stem base to which *-bar* may attach.

II.5.1.1 *-bar* attaching to transitive verb stems

The most frequent occurrence of *-bar* is in its attachment to transitive, passifiable verbs; here it is almost exhaustively productive (if contextualisable) and generally signifies that the

³⁵ There are a very small number of examples where both suffixes form synonymous constructions: *unvermeidlich* - *unvermeidbar* ‘unavoidable’; *unsäglich* - *unsagbar* ‘unspeakable’; *unüberwindlich*, *unüberwindbar* ‘insurmountable’.

action which is expressed in the verb can be executed in relation to a definite object³⁶; i.e. the *-bar* adjective can be replaced by the passive: ‘Es kann ... werden’, e.g. *buchstabier-bar* - *es kann buchstabiert werden*; cf. also: *les-bar*, *mach-bar*, *prüf-bar*, *eiß-bar* etc. Word formation and sentence structure are here strongly connected. There are some, albeit few, counter-examples; some are transitive verb stems which cannot take *-bar*, e.g. *suchen*_{trans} ?**suchbar*; and very rarely modern word formation (nb. non-standard) offers the likes of *unkaputtbar* where the base is not a verb stem.

The range of transitive verbs which do not allow for the formation of *-bar* adjectives is discussed in Toman (1983:70ff). The solution is a more detailed representation of the specific nature of the verbs’ semantics; Toman (1983:70) observes that *-bar* adjectives describe a special sort of characteristic, which may not be verifiable in every situation in general, but which will manifest itself in specific situations. This sufficiently explains the unavailability of e.g. *verbittern*, *enttäuschen*, *überraschen*, *faszinieren* etc.

This small group apart, however, it can be stated that *-bar* attaches very productively to transitive verb stems.

II.5.1.2 *-bar* attaching to intransitive verb stems

Intransitive verbs as inputs to *-bar* affixation (examples are *brenn-bar*, *streit-bar*, *sink-bar*) are the exception rather than the rule. That this should be the case is not very surprising, considering the initial general remarks about the semantics of *-bar*. If based on a transitive verb, the adjective qualifies the noun in general as having these qualities, and the potential action is expressed via the passivisation of the process, cf. ‘*Das Wasser ist trinkbar*’ - ‘*Das Wasser kann getrunken werden*’. If the base verb is intransitive, “so drückt die Ableitung auf *-bar* die Möglichkeit aus, daß sich der bezeichnete Vorgang vollzieht”³⁷ (Fleischer,

³⁶cf. Fleischer, 1974:251.

³⁷... ‘the derivation in *-bar* expresses the possibility that the described process is executed.’

1974:252). Thus, *brennbares Material* is material that can burn. In other exceptions however, Fleischer's definition does not seem to be appropriate: '*ein streitbarer Mensch*' is someone who argues very easily, while e.g. '*denkbar*' is only used attributively and never adjectivally: *'*eine denkbare Sache*', but: '*es ist denkbar*'.

For the most part, however, *-bar* adjectives cannot be formed on intransitive verb stems: **sterb-bar*, **schlaf-bar*, **ge-nes-bar*, **fallbar* (but cf. the transitive: *fällbar*) etc.

Overall, it would seem the most reasonable suggestion to place all exceptions to the pattern [Verb Stem_{Trans}] *bar*_{adj} on stratum I; the counter-examples to this formation do not share common properties and are probably easiest accounted for by listing.

As will be discussed in II.5.2.3 below, the attachment of *-ung* is restricted by similar (though not identical) criteria; it is possible to find a range of examples where the intransitive verb has been transformed into a transitive one through the attachment of either a prefix or a particle; e.g.

sprechen - **sprechbar* vs. *besprechen* - *besprechbar*

siegen - **siegbar* vs. *besiegen* - *besiegbar*

legen - **legbar* vs. *zusammenlegen* - *zusammenlegbar*

The resulting formations are then eligible for the attachment of *-bar*. This, too, seems largely accidental, considering the number of examples which have a prefix attached to a root (not a recognisable verb stem), and which can take *-bar*: *ver-einig-bar*, *be-ruhig-bar*, *be-willig-bar*, *an-fertig-bar*, *ver-eid-ig-bar*, *be-fried-ig-bar*, *er-neuer-bar* etc. The conclusion which has to be drawn from this is that irrespective of the form or composition of the verb stem, it is only transitivity which determines the attachment of *-bar*. This, in turn, also suggests that when *-bar* attaches to the verb stem on stratum II, the verb stem must, at that point, already be recognisably transitive.

II.5.1.3 *-bar* attaching to verb stems which have been formed by stem forming affixes

Formations of *-bar* attaching to verb stems which end in *-ig-*, *-el-* or *-er-* are generally quite rare. The reason for this, however, lies with the fact that many of these formations are not transitive verbs, and it is this factor, rather than the fact that the examples involve stem forming affixes, which is crucial. Thus, intransitive *kränkeln* etc. are not eligible for attachment of *-bar* at all, while *streichelbar*, *bröckelbar*, *räucherbar* etc. are possible.

According to Fleischer (1974:251f) examples of *-el-bar* can be found slightly more frequently than those in *er-bar* or *ig-bar*; mainly, however, if the *-el-* is part of the base and **not** an extension of the suffix; e.g. *ver-handel-bar*, *wandel-bar*, *be-siedel-bar* vs. **dräng-el-bar*, **an-band-el-bar* etc. Overall, it seems that the most important factor for the decision of *-bar* attachment is the transitivity of the verb base, rather than the question of whether or not this has somehow been extended; cf. examples such as **segel-bar* (where the *-el* is part of the base, but a further affix is required to permit transitivity, and thus allow *be-segel-bar*). It also seems that the majority of formations with *-el-bar* require a prefix (with the above exception of *wandel-bar*), see II.5.1.2 above.

In relation to other bases, those extended with *-ier-*, but more specifically *-isier-* and *-ifizier-* prove to be much more productive (provided, of course, that they are transitive verbs, cf. **gen-ier-bar*, **applaud-ier-bar*, **telefon-ier-bar*³⁸). *-ier-* formations attract *-bar* regardless of whether or not the root is native or non-native; *halb-ier-bar*, *buchstab-ier-bar* vs. *add-ier-bar*, *manipul-ier-bar* etc., and regardless of whether or not the root is a free form or not; *parfüm-ier-bar*, *station-ier-bar* vs. *dirig-ier-bar*, *kollab-ier-bar*. Of sole importance for the attachment of *-bar* seems to be the fact that the verb stem is transitive (cf. II.4.5 above).

³⁸Note also that the majority of those *-ier-* etc. formations that do not allow *-bar* attachment also do not allow *-ung* attachment, cf. **Genier-ung*, **Applaudier-ung*, **Telefonier-ung*.

In the list of examples with *-isier-* affixes, I have found only one example where *-bar* cannot attach: **sympath-isier-bar* (for the obvious reason that this is an intransitive verb, while all the others are transitive); but the list of positive examples is quite long (in relation to the number of verbs with this stem forming element): *legal-isier-bar*, *lokal-isier-bar*, *national-isier-bar*, *nasal-isier-bar*, *steril-isier-bar*, *atom-isier-bar* etc. Further prefixation does not influence the productivity of *-bar* formations: *ver-bürokrat-isier-bar*, *il-legal-isier-bar*, *ent-national-isier-bar*, *de-zentral-isier-bar*, *im-mobil-isier-bar*, *durch-*, *um-*, *re-organ-isier-bar* etc.

Among the *-ifizier-* verbs, I could not find any to which *-bar* would not attach: *qual-ifizier-bar*, *glor-ifizier-bar*, *elektr-ifizier-bar*, *klass-ifizier-bar*, *rat-ifizier-bar*, *ident-ifizier-bar*, *not-ifizier-bar*; and, as above, also with prefixation: *um-*, *weiter-*, *dis-qual-ifizier-bar* etc. This is interesting, again with a view to the attachment of *-ung*, since all these examples also permit an *-ung* formation: *Qualifizierung* etc. Again it is likely that the semantics of *-ifizier-* is connected with this phenomenon, since it roughly covers ‘to do x to someone/something’ - so that the *-bar* describes that the someone/something can be x-ed. Verb stems in *-ifizier-* are always monotransitive, i.e. need a direct object and are therefore singularly well equipped to qualify for the input to the formation of *-bar* adjectives.

II.5.2 Noun formation: [Verb stem] *-ung*_N

“Kurz, die Ableitung auf *-ung* ist, abgesehen von der Substantivierung des Infinitivs, das beliebteste Mittel geblieben, Verbalabstracta zu bilden.”³⁹
(Wilmanns, 1896:375).

The suffix *-ung* is, along with a few others (e.g. *-er*), the most productive noun-forming suffixes in German. It is however quite important to keep in mind that the resulting derivations may be structurally and semantically quite distinct, compare e.g. the *nomina*

³⁹ ‘In short, the derivation in *-ung* has remained the most popular method of forming verb abstracts, apart from the substantivisation of infinitives.’

actionis Fütterung ‘feeding’ and the abstract noun *Hoffnung* ‘hope’. What all formations in *-ung* have in common is the nature of their bases, which are now predominantly⁴⁰ verb stems. With a view to establishing a more restrictive definition of the quality of these verb stems, I would like to concentrate on the discussion of varying criteria which may or may not allow for the attachment of *-ung*.

The nouns discussed here which are derived via the suffix *-ung* have a verb stem as their base. This generalisation goes quite a long way to further the argument of the existence of the category stem in German, and illustrates the obvious lexical category information that has to be present in the base: if the base is **not** a verb stem, and recognisable as such, the noun-forming suffix *-ung* cannot attach. Derivation with *-ung* is very productive and fairly unrestricted; both strong and weak verb stems may serve as the base, e.g. *Brechung* ‘refraction’, *Lesung* ‘reading’ etc., and the verb base may be simplex (e.g. *Trennung* ‘separation’) or complex (e.g. *Nachvertonung* ‘setting (to music)’). Furthermore, verb stem-forming affixes may or have to be used in order to trigger the attachment of *-ung*, e.g. *Blondier-ung* ‘bleach (hair)’ (see II.1.4.a) or *Be-leb-ung* ‘revival’ (see II.1.4.c).

It is however slightly puzzling to note that *-ung*, considering its wide-ranging productivity, is nevertheless banned on a relatively wide range of bases. The reasons for this have as yet to be established; as a general observation at this point it may suffice to say that often *-ung* attachment is blocked where there are more ‘simple’ ways of nominalisation available – most notable the nominalised infinitive. e.g. *das Lachen* ‘laugh’, *Heulen* ‘cry’, *Singen* ‘sing’ etc. As Giegerich (forthcoming) observes, Paul (1897:707) seems to be the first to comment on this blocking phenomenon, and to list a range of examples where the use of *-ung* as a noun forming affix is blocked by the existence of another form, e.g. *Lob* ‘praise’ (**Lobung*),

⁴⁰ Cf. the quote by Wilmanns (1896:372) above; it is also mentioned in Paul (1920:73) that *-ung* is likely to have originally served to create derivations from nouns; examples where *-ung* attaches to a nominal bases are *Stallung* ‘stables’, *Zeitung* ‘newspaper’, *Nahrung* ‘food’ etc. I will consider these formations as exceptional, since they are clearly no longer productive, and are, furthermore not the *nomina actionis*. with verbal bases that I intend to investigate here. See also II.5.1 on *-bar* above.

Raub ‘robbery’ (**Raubung*, but: *Ausraubung*), *Wahl* ‘election’ (**Wählung*), *Verlust* ‘loss’ (**Verlierung*), *Gebrauch* ‘use’ (**Gebrauchung*). In an LP framework, these forms must be assumed to be listed on stratum I; only then can they successfully block the attachment of *-ung* which, since it attaches to verb **stems**, must be located on stratum II.

There is, of course, also a range of semantic criteria to be considered. Again, transitivity seems to be of crucial importance here. *Nomina actionis* in *-ung* are not produced from e.g.:

- durative verbs, e.g. *schwimm-* ‘swim’ **Schwimmung*; *schlafen* ‘sleep’, *essen* ‘eat’, *laufen* ‘walk’, ...
- iterative/frequentive verbs: *flattern* ‘flutter’, *gackern* ‘cluck’, *plätschern* ‘splash’, *streicheln* ‘stroke’, ...
- intensive verbs: *brüllen* ‘roar’, *saufen* ‘drink (lots)’, *sausen* ‘howl’
- diminutive verbs: *hüsteln*, *tänzeln*, *lächeln* (but: *-ung* cannot attach to *husten*, *tanzen* etc. either)
- ingressive (inchoative) verbs: *aufblühen* ‘bloom’, *einschlafen* ‘fall asleep’, *entflammen* ‘ignite’, *erblicken* ‘catch sight of’, *loslaufen* ‘start running’ but: *erkranken* ‘fall ill’-
Erkrankung
- egressive verbs: *verblühen* ‘wither’, *verklingen* ‘die away (tone)’, *zerschneiden* ‘cut’, *platzen* ‘burst’ but: *genesen* ‘recuperate’ - *Genesung*

They may, however, sometimes be formed from

- mutative verbs: *reifen* ‘ripen’, *sich erkälten* ‘catch cold’; but not: *rosten* ‘rust’
- causative/factitive verbs (because they are transitive): *beugen* ‘bend’, *öffnen* ‘open’, *senken* ‘sink (trans.)’, *sprengen* ‘blast’, *verschwenden* ‘waste’.

Examples that are mentioned in Fleischer (1974:174) as being exceptional in that their bases are not verb stems, but rather seem to be based on nouns or adjectives are *Waldung*,

Holzung, Stallung, Satzung; Festung, Niederung. Examples of this type are so unproductive that the only way to deal with them would appear to be listing of the whole forms on stratum I.

Consider examples such as *Be-wahrheit-ung*⁴¹, *Ver-gesellschaft-ung*. Neither **Wahrheitung* nor **Gesellschaftung* are well-formed, which means that the attachment of verb-forming *be-* and *ver-* has to precede the attachment of *-ung*. Whatever one chooses to call the bases *Wahrheit* and *Gesellschaft* in this derivational process (keeping in mind that both roots and stems are recursive categories in German), it is undeniable that *Bewahrheit-* and *Vergesellschaft-* can only ever be interpreted as verb stems. The next step in the derivation is consequently for *-ung* to attach to these verb stems - it could not have been attached before. To take another example: [*Ver* [[*sinn*]_N [*bild*]_N]_N *lich*]_{ADJ}]_V *ung*]_N 'allegory'. Here, the order of affixation starts with the combination of *Sinn-bild*, is followed by the attachment of *-lich*, then the prefixation of *Ver-* (to create the verb stem), and only then completed by the attachment of *-ung*.

The same phenomenon can be observed with adjectival bases: *Ver-heimlich-ung* is based on *verheimlich*_{V stem}, not from *heimlich*_{Adj}, compare **Heimlichung*. Similarly:

[[*Ver*[[*staat*]_N *-lich*]_{Adj}]_{V stem} *-ung*]_N, [[*Ver*[*herrlich*]_{Adj}]_{V stem} *-ung*]_N, [[*Er*[*möglich*]_{Adj}]_{V stem} *-ung*]_N; also *Verehelichung, Vergegenständlichung, Verweichlichung, Vermenschlichung, Verwirklichung, Veranschaulichung, Erkältung* etc.

II.5.2.1 *-ung* attaching to transitive verb stems

The criteria according to which *-ung* may attach to a verb stem do not appear to be the same as e.g. with the attachment of *-bar*, cf. II.5.1 above. Even though derivations with *-ung* appear more frequently on transitive verbs stems than on intransitive ones, the division lines

⁴¹ I am not going to attempt to translate all of the formations in *-ung* and *-bar*, since their compositional semantics are sometimes too complex and would need to be translated by phrases; e.g. *Bewahrheitung* amounts to 'prove-true-ness'.

are not as clear cut as they are with *-bar*. While there are numerous examples of transitive verb stems as bases for *-ung* attachment (e.g. *Sendung* ‘parcel’, *Erwartung* ‘expectation’, *Anregung* ‘encouragement’ etc.), there are also quite a number of examples where the formation is ill formed, e.g. **Besuchung* (blocked by *Besuch* ‘visit’, but cf. *Heimsuchung* ‘haunt’), **Essung* etc.

Examples that are given in Fleischer (1972:164) are mainly *nomina actionis*; only a few could also be interpreted as concrete nouns:

Gründung, Klärung, Bindung (also concr.), *Duldung, Glättung, Tötung, Spaltung, Ladung* (more likely to be concrete; cf. *Beladung*), *Hebung* (also concr.)

-ung may also attach to complex bases (examples from Fleischer (1972:165); again all *nomina actionis*:

'Ablösung, 'Aufhebung, 'Aufschiebung, Be'lebung, Be'sprechung, 'Einführung, Er'regung, Ent'lüftung, Ent'wendung, 'Eingemeindung, Über'raschung, Über'fremdung, 'Einweihung, Er'findung (could also be concr.), *Ver'bindung* (could also be concr.)

II.5.2.2 *-ung* attaching to intransitive verb stems

The majority of intransitive verb stems do not seem to be available for the noun formation with *-ung*, e.g. **Denkung, *Reisung, *Wachsung* etc. Again, however, there is a notable number of exceptions to this claim: *Erkrankung* (ingressive, cf. *Genesung* - egressive), *Wohnung* (as a concrete noun; cf. *Bewohnung*). Overall, the formations with an intransitive base are very frequently either abstract or concrete nouns that do not have the same semantics as the *nomina actionis* found so frequently in the transitive equivalents; rather, what is being formed is a noun that describes the action in a more generic way. Interestingly, a number of intransitive verb stems can be made available for *-ung* attachment after a prefix has converted them to transitive verb stems (see II.5.2.3 below).

Examples from Fleischer (1972:164):

Atmung, Wanderung, Fahndung, Wirkung, Strandung, Zuckung, Heilung, Fühlung, Schwankung, Landung, Drohung (also concr.?)

concrete: *Mündung, Gleichung, Handlung, Steigung, Brandung, Geltung, Hoffnung, Rechnung, Sitzung, Strömung, Werbung*

The group of examples here, compared to the one with transitive bases in II.5.2.1, is noticeably smaller; and (see also II.5.2.3 below) it is quite possible that examples here may all be listed. Productivity with respect to *-ung* attachment can only be achieved if the verb stem is transformed into a transitive one via the attachment of a prefix, as will be discussed in II.5.2.3 below.

II.5.2.3 Intransitive verbs transformed into transitive verbs via prefixes or particles

It is interesting to note that in some instances verbs stems which are in their simplex form not available for *-ung* attachment can be transformed into a possible base for *-ung* by prefixation, by undergoing a transformation from an intransitive verb stem to a transitive one: they now require an object (n.b. not always a direct object, though): *Ent'sagung, Ent'ledigung, Ent'sprechung, 'Abweichung, 'Einwirkung, Er'mangelung, Er'scheinung* etc. Thus, the pattern we can establish is as follows:

<i>leben</i> 'to live'	<i>beleben</i> 'to liven up'	<i>*Lebung</i>	<i>Belebung</i>
<i>sprechen</i> 'to speak'	<i>besprechen</i> 'to talk about'	<i>*Sprechung</i>	<i>Besprechung</i>

There are, of course, some verbs that are never available for nominalisation with *-ung*, e.g. *trinken* 'to drink' - *betrinken* 'to get drunk' (**Trinkung* - **Betrinkung*), but it has to be noted that the attachment of the prefix here does not change the intransitive candidate into a transitive one. For all other examples, the nominalisation is instead achieved by the affixation of *-en*: *das Lachen, Leben, Reden* etc.

A group which can be said to have limited productivity is therefore that of intransitive verbs that have been made available for transitive use through the attachment of a prefix, e.g.

schaden - *beschädigen*, *antworten* - *beantworten*, *warten* - *erwarten*, *folgen* - *befolgen*, *lauschen* - *belauschen*, *streben* - *erstreben* etc. where only the transitive counterpart is available for *-ung* attachment, *Beschädigung* etc., while the intransitive version would be illformed, e.g. **Antwortung*.

However, there are also a number of examples where the intransitive stem seems to be available for nominalisation via *-ung* **before** the transformation to transitivity:

(1a) <i>drohen</i> 'to threaten'	(1b) <i>bedrohen</i>	(2a) <i>Drohung</i>	(2b) <i>Bedrohung</i>
<i>hoffen</i> 'to hope'	<i>erhoffen</i>	<i>Hoffnung</i>	<i>Erhoffung</i>
<i>steigen</i> 'to climb'	<i>besteigen</i>	<i>Steigung</i>	<i>Besteigung</i>

What is interesting to note about these examples is that the *-ung* formations in (2a), resulting from the intransitive verb stems in (1a) are qualitatively quite different from the formations in (2b). While the nominalisations of the transitive verb stems (2b) lead to *nomina actionis*, i.e. nouns that describe the activities of the original verb, the noun formations resulting from intransitive verbs are either abstract or concrete nouns.

II.5.2.4 verb stems including stem-forming affixes and *-ung* affixation

Already in OHG it is quite frequent to find verbs stems that carry another suffix before the attachment of *-ung*, and in Modern German this process is very productive. This extension may be a stem-forming suffix, of the type *-ier-* or *-ig-* as discussed in II.4 above, which is necessitated by the fact that the base would otherwise not be recognisable as a verb stem, and therefore not be eligible for *-ung* attachment. As was the case with some examples in II.5.1 above, there are some verb stem forming affixes, e.g. **Kränk-el-ung*, **Frömm-el-ung*, **Tänz-el-ung*, which do not allow for this formation; and once again the reason for that lies

in the intransitive nature of the verb stems, rather than in the fact that they are formed by a stem forming affix.

As has been discussed in II.4 above, some of the most productive verb stem-forming affixes are *-ier-*, *-isier-*, *-ifizier-*, particularly in conjunction with non-native roots. Consequently, it is unsurprising to find that derivations from these verb stems are very frequent, e.g.

-ier-: *Halbierung*, not: **Halbung*; *Radierung*, *Liquidierung*, *Grundierung*, *Bastardierung*, *Einstudierung*, *Ausstaffierung*, *Diphthongierung*, *Assoziierung*, *Blockierung*, *Möblierung*, not: **Möbelung*; *Isolierung*, *Inszenierung*;
-isier-: *Sozialisierung*, not: **Sozialung*; *Periodisierung*,
-ifizier-: *Identifizierung*, *Klassifizierung*, *Elektrifizierung*, *Qualifizierung* etc.

As indicated, *-ung* attaches only if the base is a verb stem, which is here created by the extension *-ier-* etc. Without this stem-forming suffix, the base would not be recognisable as carrying the lexical category verb, and *-ung* attachment would not occur. The counter-examples also indicate quite unambiguously that *-ung* (as well as *-bar*, see II.5.1 above) may only attach to verb stems, and not to either roots or stems with a lexical category specification **other than ‘verb’**.

The same argumentation applies to examples where the verb stem is formed with a different stem-forming affix, or affixes; most frequent among these is a combination of prefix and suffix, e.g. *be-* ROOT *-ig-* as in *Be-glaub-ig-ung* ‘certification’, cf. *glauben* ‘to believe’, *beglaubigen* ‘to certify’; *Be-schäd-ig-ung* ‘damage’, cf. *schaden* (with dative case), *schädigen* (with accusative case), *beschädigen* (with accusative case) ‘to damage’; *Ver-ständ-ig-ung* ‘communication’ cf. **ständen*, **ständigen*, **verständen*, but: *verständigen* ‘to communicate’; *Zücht-ig-ung* ‘punishment’, cf. *züchten* (semantically unrelated: ‘to breed’).

Examples without prefixes are *Peinigung*, *Huldigung*, *Kreuzigung*, *Festigung*, *Ängstigung*, *Steinigung*, *Folg-er-ung*, *Mild-er-ung*.

II.6 Conclusion

The analyses in this chapter have shown that there is a clear case for positing the category 'stem' intermediate between 'root' and 'word' in German. The discussion here was concentrated particularly on formations resulting in verbs, or using verb stems as inputs, and observations concerning the category verb **stem** specifically. It has been shown that there must be a level of category which is intermediate, and flanked to one side by the category root, and to the other by the category word. Roots, as has been suggested in the definition in chapter I (I.3), are those forms which may still be unspecified for a lexical category (e.g. *fris-*, *halb-*, *segel-*), which may be bound and which may be recursive. Words are the free forms which are dealt with on the final stratum. Stem, a category which cannot be said to exist in English any longer (cf. I.3) is the level in-between roots and words; a category which is visibly required in German word formation processes, e.g. particularly as an input to the affixation of adjective forming *-bar* and noun forming *-ung*. Stems (e.g. *frisier-*, *halbier-*, *besege-*) may be formed by visible stem forming affixes (both prefixes (cf. II.3.3) and suffixes (II.4)).

As has been shown in the discussions in II.5 above, roots, which have not had a stem forming affix attached to them, could never be a potential input to *-bar* attachment, cf. **halb-bar*, * *buchstab-bar*, **il-legal-bar*, * *dis-qual-bar* etc. The reason for this must undoubtedly lie in the qualities of these base forms (i.e. qualities that they do **not** possess, as opposed to those forms that readily avail themselves for *-bar* suffixation). This first observation led to the speculation that there must be a fundamental difference in quality of the two base forms, e.g. *fris-* and *frisier-*. The former is what I call a 'root': it is not necessarily specified for a lexical category, and it is the base for processes such as the attachment of *-eur_N*, *-ur_N* etc. This root could however not provide the base form for the attachment of e.g. inflectional affixes: **fris-e*, **fris-te* etc. are ill formed; a further affix is

required to transform this root into something that (a) has a specific lexical category and that therefore (b) allows the attachment of inflectional suffixes. Thus, *frisier-* on the other hand is what will be called a ‘stem’; a (in this instance) complex form which bears a lexical category (verb) and which is the obligatory input for the attachment of e.g. the whole range of (verbal) inflectional affixes, including the infinitive ending *-en*, as well as derivational processes (II.5) and compounding (cf. chapter III).

If the argument is accepted that *fris-* as a root is lacking the lexical category specification, while *frisier-* as a stem has been extended in such a way that it is now carrying the lexical category ‘verb’, it becomes immediately apparent why the attachment of inflectional affixes is no longer a problem: the item carries unambiguously the category specification ‘verb’ - and therefore does not require any further derivational affixes that give it its initial word class. This verb stem **may** however also take derivational affixes such as e.g. *-bar*_{ADJ}, *-ung*_N etc. which then **change** the lexical category into adjective and noun respectively.

The interesting observations in II.5 now derive from a simple comparison that can be made between the different base forms to which e.g. *-bar* attaches: they are unequivocally verbs (and, more specifically, transitive verbs in the vast majority of cases). The fact that this suffix is extremely productive makes it a very good candidate for stating a hypothesis that may at a later point be verified by other examples. Looking at the lists of base forms to which *-bar* attaches, it is quite apparent that the reason it does not attach to the root forms *fris-*, *gen-*, *elektr-* is that these roots are not yet identified as ‘verbal’. After the attachment of the stem-forming elements *-ier*, *-isier-*, *-ifizier-* etc. however, the category specification is unambiguous, and *-bar* attaches to what is now recognisable as a verb stem. Comparing this to those base forms which are available for *-bar* attachment without further suffixation leads to the thought that these forms must be recognisable as verb stems as well: *les-bar*, *trink-bar*, despite the fact that they do not show visible verb stem forming affixes.

These arguments also hold for those potentially ambiguous cases, where it may be argued that the root can be interpreted separately as a noun or adjective, e.g. *halb-*, *zahl-*, *grab-* etc. It has been observed that, within the theory of LP, these examples are in fact roots without any word class specification (which they will get at a later point in the derivation even if left un-suffixed, by means on the root-to-stem and stem-to-word conversions on strata 1 and 2). This point however is completely irrelevant for the observations at hand: what matters is that *-bar* will only attach to a verbal stem, and if the item cannot be recognised as such (leaving the matter aside of whether it is ‘nothing’ i.e. a ‘bound root’, or of a potentially different denomination) will not attach until further processes have created the appropriate environment.

Chapter III: *Leselampe* vs. *Lesart*. Linking elements in the juncture position of German¹ [[Verb stem] __ [Noun]] compounds

III.1 Introduction

The following chapter deals with compounds which have a verb stem as their first element and a noun as the second. Unlike compounds which have a noun as their first element (and which will be discussed in chapter IV), compounds of this kind have only come into existence in German gradually, possibly via the use of *nomina actionis* and subsequently verb stems as first elements in compound formation, and are not in evidence e.g. in Indo-European (Paul, 1920:21). There is evidence for [[Vstem][N]] compounding in OHG, but the process has only become truly productive in more recent developments of the language. These formations, which do not seem to have been investigated in any great depth, are interesting in several respects. The issue which is addressed here is that of the possible presence of schwa² in the juncture position, a topic which is alluded to e.g. in Wilmanns (1896:537), but which has been brushed aside in more recent literature. Is schwa really only inserted (or: retained) after voiced obstruents (as has been claimed e.g. in Paul (1920:22), Henzen (1965:70f), Wurzel (1970: 104) and Raffelsiefen regarding adjectives (1995: 19ff)), or may there be other factors (morphological, prosodic, phonotactic etc.) which trigger the insertion?

Another issue that is of interest in these formations is of a semantic as well as morphological nature; it is the question of whether or not [[Vstem] __ [N]] can be at all differentiated from [[N] __ [N]] in cases of homophony, e.g. *Schlaf-zimmer* 'bedroom (lit. 'sleep room')', *Bau-*

¹ [[V] __ [N]] compounds in English are not only rare, but also appear to be of a different nature from the German formations in that they resemble NPs rather than true compounds (cf. Stöhr, 1987:33f); e.g. *swimming trunks*, *singing bird*, *drift wood*, *hovercraft* (cf. also Lieber (1983)). For a discussion of English compounds, see chapter V.

² It is actually impossible to know *a priori* that schwa is epenthesised rather than retained; the choice of terminology has to be regarded as arbitrary until further evidence has been provided. I will refer to the phenomenon as schwa epenthesis or insertion, see III.2 for details.

stein ‘building block’, *Trauer-kleid* ‘mourning dress’, *Reise-geld* ‘travel money’³, where *schlaf-* etc. can be both a verb stem (cf. *schlafen*) and a noun (*Schlaf*). Also, there is the question of whether or not the schwa can be compared to other linking elements which so frequently occur in [[N] __ [N]] compounds (*Heirat-s-schwindler* ‘marriage impostor’, *Schwein-e-stall* ‘pig sty’ etc.).

In this chapter, I will at first briefly discuss the main literature on the topic of linking elements in [[Vstem] __ [N]] compounds, of which there is surprisingly little (III.2). The next section (III.3) will present data organised in two tables; the first contains examples of the environment said **not** to cause schwa insertion, and the second shows examples which, according to the predictions, should all show schwa insertion. Subsections III.3.1 - III.3.4 contain short explanations of various kinds of analytical approaches (phonotactic, prosodic, morphological, semantic).

The main difficulty with the data presented in III.3 is that for the majority the examples are well-known, established, ‘lexicalised’ forms, which are in common and frequent usage and may therefore show a certain degree of ‘fossilisation’. For example, a form such as *Hebamme* ‘midwife’, which according to the insertion hypothesis (see below) **should** have a schwa in the juncture position (cf. *Hebebühne*), can be shown to originally have had the schwa, *hebeamme* in MHG (Kluge, 1989: 298), which subsequently must have been lost. The sheer amount of old, established compounds which show a similar development has led me to collect another batch of data, this time new formations that can be made up spontaneously. III.4 then contains such hypothetical formations, with an in-depth evaluation of the new perspective that this kind of data brings to the problem of schwa insertion in [[Vstem] __ [N]] compounds in general. It is also in III.4 that the issue of homophony

³ Examples from Grammatik Duden (1995:475), where it is also stated that: “Ein Teil dieser Bildungen bezieht sich allerdings zugleich auf ein substantivisches Verbalabstraktum, ist also gewissermassen doppelt motiviert.” (‘Some of these formations are simultaneously related to a nominalised abstract verb, and are thus, as it were, doubly motivated.’)

between verb stems and nouns as the first element of a compound is addressed (cf. IV.3.15), and true generalisations become possible which are based on the productivity of the phenomenon. III.5 sums up the findings and reflects on the difference between /ə/ in [[Vstem] __ [N]] compounds and the various linking elements in [[N] __ [N]] compounds.

III.1.1 The new data: methodology and collection

The new [[Vstem] __ [N]] compound formations discussed in III.4 as well as the data which is discussed in the second part of chapter IV require a certain justification considering that the forms under investigation are not dictionary entries. At least four of the five variables which Hudson (1996) notes as being important for sociolinguistic study are relevant here, too (despite the fact that this collection of novel compounds is obviously **not** part of a sociolinguistic study); namely the selection of speakers, the collection of the data, the processing of the data and the interpretation of the results. The first three point will be briefly dealt with here, while the fourth point is covered in the actual analyses in III.4 and IV.3. Crucially, due to the nature of the data (i.e. novel compounds), the actual collection cannot be based on recordings of casual speech, but rather takes the form of lists which are presented to a number of subjects.

The subjects which were chosen to create formations and verify the admissibility of formations were five males and five females, all aged between 24 and 35 years, from a wide range of areas (so as to limit the extend of influence of regional variation):

Speaker A	Female	Vienna, Austria (City)
Speaker B	Female	Bonn (Region)
Speaker C	Female	Cologne (City)
Speaker D	Female	Dresden (Region)
Speaker E	Female	Hanover (Region)
Speaker F	Male	Munich (City)
Speaker G	Male	Hamburg (City)
Speaker H	Male	Berlin (City)
Speaker I	Male	Frankfurt (Region)

The speakers were aware of the purpose of the study, and of the particular attention that was being paid to linking elements. The formations were however not presented to them initially, but formed by them from lists of separate A and B constituents. Only in a second round of tests were the speakers asked to simply verify the compounds (which had been created by them) as grammatical.

For the forms discussed in III.4, I created a list of A elements for potential compound forms AB based on specific properties of the A element. The list contains forms ending in phonological material which has been claimed (see III.2) to trigger an insertion of a linking element, and forms which end in phonological material which has been claimed to prevent such an insertion. Within these two groups, distinctions have also been introduced to facilitate comparison between nominal and verbal A elements, and the possible importance which a presence or absence of schwa may have in establishing the nominal or verbal identity of the constituent (for the actual list, see the table in III.4). The B elements (restricted to 12 different forms for ease of comparison) have been chosen to allow a simple combination of A and B constituents in order to form a compound; some have been chosen specifically because of their properties to unambiguously identify the preceding constituent as verbal (again for the list of B forms, see III.4 below).

The data under investigation in IV.3 contains A elements which are morphologically simplex nouns listed in the inflectional category they occur in (no other criteria apply); there are three additional sets of A elements ending in derivational suffixes (IV.3.13), A elements which are themselves already compounds (IV.3.14), and A elements which may be interpreted as verb stems (IV.3.15). The B elements are again restricted in number, and some are chosen so as to either force the A element to be unambiguously nominal or so as to allow for ambiguity.

The collection of the actual compounds was conducted in two stages. Lists of uncombined A and B elements were presented to the subjects, and a request was made to form compounds. Depending on the data, this request was further constricted by the need for additional explanation if the resulting form could be interpreted as either nominal or verbal in case of the data needed for III.4, or whether the semantics of the A element could be interpreted as plural or singular or either, with respect to the data in IV.3. The lists of A and B constituents were in front of the subjects in typed form, and the results were communicated orally.

The second stage of data collection was the verification of the data: the lists of new formations which had been created by all subjects were then shown to all subjects again (e.g. speaker A was given a list containing all combinations created by speakers A-J, not just the ones previously created by speaker A alone), and recognition and acceptability of the formations was questioned. Only forms which in this second round of the trial gained support from 75% of the speakers have been allowed to remain and are the forms used in the analyses in the following two chapters. I have not had the time and space to analyse in detail which forms have been rejected by which speakers, though it would undoubtedly have been very interesting to do so. It would, however, have shifted the scope of my analysis considerably.

III.2 Literature review

The insertion hypothesis for /ə/ in the juncture of [[Vstem] __ [N]] compounds according to Wurzel (1970:104) etc. states the following:

(a) $\emptyset \rightarrow \text{ə} / [\text{Verb stem}_{[+voice, +obs]}] _ [\text{Noun}]$

e.g. *Bad-e-hose* ‘swimming trunks’, *Les-e-lampe* ‘reading light’, *Nag-e-tier* ‘rodent’ (lit. ‘gnawing animal’)

(b) Elsewhere: $\emptyset \rightarrow \emptyset^4$ / [[Verb stem] __ [Noun]

Leit-faden ‘main thread’, *Schwimm-flügel* ‘water wings’, *Mach-art* ‘make, design’

There are several issues which require clarification prior to an analysis of the proposed rules. Firstly, it is not clear whether schwa is being inserted or retained, since the voiced obstruents after which it is said to occur would not be voiced⁵ if the schwa were absent. Obstruents may only appear as voiced in syllable initial position; the schwa adds the syllable nucleus to which they can become onsets and thus remain/become voiced. If no schwa is inserted, or if the schwa is deleted, the obstruent devoices. A general observation about schwa being diachronically ‘retained’ after voiced obstruents (here in word final position in adjectives) can be found as early as Wilmanns (1896:260):

“Wo das *e* unmittelbar auf die Stammsilbe folgt, übt oft der Auslaut des Stammes einfluß. Apokope tritt leichter ein nach stimmlosen Verschluss- und Reibelauten, nach Nasalen, Liquiden und Vocalen, die im Auslaut ebenso gesprochen werden wie im Inlaut, als nach stimmhaften Verschluss- und Reibelauten, die zugleich mit dem *e* ihren Stimmton verlieren, also durch die Apokope verändert würden; mhd. *spæte*, *küele*, *lære* sind nhd. *spät*, *kühl*, *leer* geworden, mhd. *æde*, *trüebe*, *wîse* sind öde, *trübe*, *weise* geblieben.”⁶

This, interestingly, contradicts initial observations about the loss of schwa after voiced obstruents in lexicalised compounds; it remains to be seen whether the specific environment

⁴ I do **not** interpret this ‘ \emptyset ’ as a zero morpheme. \emptyset here simply stands where a linking element could be found, but is not there; it merely indicates an empty position, and is not a zero morpheme which fulfills a function (cf. Wurzel (1984:38)).

⁵ Whether this is an instance of ‘voicing’ or ‘tensing’ (cf. Giegerich (1989:51)) is not of importance here; the main objective of this discussion is to determine the environment of schwa vs. \emptyset .

⁶ ‘Where *e* follows immediately after the stem syllable, the final segment of the stem often exerts influence. Apocope occurs more readily after voiceless stops and fricatives, after nasals, liquids and vowel, which sound identical in initial and final position, rather than after voiced stops and fricatives, which lose the voicing together with the *e*, and so would be changed through apocope; MHG *spæte*, *küele*, *lære* have become *spät*, *kühl*, *leer* in Modern German, MHG *æde*, *trüebe*, *wîse* have remained *öde*, *trübe*, *weise*.’

of the juncture position between two parts of a compound (and the word class of the first element) may have an influence on apocope occurring there.

Wurzel (1970: 104) claims that verbs in compounds ‘generally trigger the insertion of /ə/’, “das dann später unter bestimmten Bedingungen wieder entfernt wird”⁷. He suggests that this elimination would take place after all verb stems which do not end in voiced obstruents, and cites a few examples. His approach actually argues for a general epenthesis of schwa in the context of **any** [[Vstem] __ [N]] (see III.3 below), followed by a deletion rule which removes it again except where it follows a voiced obstruent, where it is ‘retained’. Wurzel argues that the rules have to be arranged in this way (as opposed to an insertion only after voiced obstruents, which would be much easier in the circumstances) because he views the schwa epenthesis in compounds as a basically morphological rule, which should not be solely based on phonological triggers. While this view is obviously simplistic (but perhaps in line with the morphological theory of its time), it is worth noting that Wurzel spends less than a page discussing this issue, and thus does not go into any kind of detail, such as counterexamples and other, e.g. morphological, problems with this rule. See IV.1.3. for an overview of his (more indepth) analysis regarding linking elements in nominal compounds.

There is a big difference between the kind of schwa retention proposed by Wurzel (1970) and that alluded to in Wilmanns (1896): for Wilmanns schwa is diachronically retained in the post- [voiced obstruent] environment only, and has never been inserted into and subsequently deleted from any other environment. Wurzel on the other hand aims to work synchronically and is therefore required to have schwa epenthesised across the board prior to its deletion from the environment in which schwa never occurs or alternates. Wurzel’s approach is undesirable because the vast overall majority of all [[Vstem] __ [N]] compounds do not have the schwa - so that it would seem to be a costly undertaking to have it inserted everywhere and subsequently deleted in the majority of cases. Furthermore, to delete it from

⁷ ‘... which is later removed again under certain conditions.’

the ‘elsewhere’ - environment means having to unite a heterogeneous group of otherwise unrelated features. Since the general claim is that schwa is ‘retained’ after all voiced obstruents, the elimination rules have to be specified to include voiceless obstruents and sonorants (including vowels) (cf. Wurzel, 1970:181), which do not constitute a natural class. Wurzel’s analysis is however not just awkward but actually wrong, because of the overwhelming number of counterexamples which prove that the assumption of final voiced obstruents as an unfailing trigger for schwa-‘retention’ is an over-simplification of the facts. Considering that I, too, am working synchronically and do not propose that every speaker of the language is aware of whether or not a compound had the schwa in MHG, it would appear that schwa epenthesis, which specifically only occurs where it is triggered (how and by what is the main concern of this chapter), is the most sensible solution.

Taking into account that the space given by Wurzel (1970) to the analysis of [[Vstem] __ [N]] forms is so limited, it seems important to follow up a cross-reference to a parallel analysis which Wurzel himself suggests (and to which more detailed attention is given). Wurzel applies the same rules of schwa epenthesis and subsequent elimination to *Ge-* Vstem *-(e)_N* formations such as *Gefolge* ‘entourage’, *Geschiebe* ‘pushing’ vs. *Gefühl* ‘feeling’, *Gebräu* ‘brew’, and proposes that exactly the same environment (i.e. schwa after voiced obstruents) be responsible here for the retention of the epenthesised schwa as well. A number of cases where schwa turns up after /ŋ/ (*Gehänge* ‘festoon’, *Gestänge* ‘poles’) is said to show that “die zu formulierende Eliminierungsregel der /g/-Tilgung nach velarem Nasal vorausgehen muß, damit nicht aus [ge + stän + e] schließlich **Gestäng* entsteht.”⁸ (Wurzel, 1970:180). However, without going into any details about these formations, I would like to point out that I consider Wurzel’s generalisations to be just as superficial here as in the previous environment, since they do not account for a wealth of cases (which are, however, morphologically different, see below), cf. *Gehuste* ‘coughing (derog.)’, *Gejohle*

⁸ ‘... that the rule of elimination which is to be formulated has to precede the deletion of /g/ after a velar nasal, so that [ge + stän + e] does not turn into **Gestäng*.’

‘shouting’, *Gekeife* ‘squawking’, *Gesause* ‘rushing’, *Gekratze* ‘scratching’, *Geklopfe* ‘knocking (derog.)’, *Gesumme* ‘humming (derog.)’, *Gedränge* ‘shoving’, *Gezerre* ‘pulling’ etc., where schwa is found in an environment not predicted by Wurzel, and where it furthermore seems to be quite productive as well, cf. *?Gekoche* ‘cooking (derog.)’, *?Geheirate* ‘marrying (derog.)’, *?Genasche* ‘nibbling (derog.)’, *?Gebacke* ‘baking (derog., the action of baking)’ (but compare lexicalised *Gebäck* ‘baking’).

There are two points regarding these examples which might be worth considering: (1) there do not seem to be any examples where a voiced obstruent is **not** followed by a schwa (for phonotactic reasons; without the schwa it would be devoiced); (2) the presence of schwa seems to be more dependent on the semantics of the resulting formation, in that all of the above-mentioned counterexamples to Wurzel’s observations are *nomina actionis*⁹ - so that schwa may serve here to indicate that, rather than being motivated simply and only by the phonotactics, the resulting formation is not only **based** on a verb, but is retaining this fact (i.e. in the semantics) after the derivation. That way, forms that are not based on verbs (or where this fact might be obscured), such as *Gebirge* ‘mountains’, *Getier* ‘animals’, *Gebüsch* ‘bushes’, *Gelände* ‘terrain’, and forms that result in concrete or abstract nouns, rather than action nouns, such as *Gefühl* ‘feeling’, *Gefolge* ‘following’, *Gehäuse* ‘shell’, *Gebräu* ‘brew’ (cf. the non-umlauted action noun ‘counterparts’ *?Gehause*, *?Gebraue*, formed from the verb stems of *hausen* ‘to live’, *brauen* ‘to brew’) can actually warrant a different analysis, because lexicalisation may have had a strong influence on the present forms. Wurzel does not make this distinction.

Žepić (1970:67ff) also offers a relatively brief, and hence restricted, analysis of the topic; his main concern is the phenomenon of linking elements found in nominal compounding. He examines the /ə/ in the juncture of [[Vstem] __ [N]] compounds from a purely phonotactic

⁹ These action nouns are furthermore also predominantly of a derogatory nature, cf. formations with the suffix *-erei*; cf. also the difference between *Singerei* ‘singing (derog.)’ and *Bäckerei* ‘bakery’.

viewpoint. From this perspective, however, he is the first one to point out the error of restricting the environment to ‘voiced obstruents’ (1970:74), and also the first one to introduce the velar nasal into the group of segments which are frequently followed by schwa. His examples (and he has a long list, contrary to all other literature on the topic) allow him to conclude that /b, d, g, z/ **and** /ŋ/ are regularly followed by /ə/, and that /f, x, k, ç/ and /t/ may sometimes be followed by /ə/, but are rare enough to qualify as exceptions (Žepić, 1970:72). In his summary, Žepić (1970:73) puts the phenomenon of schwa in the juncture of [[Vstem] __ [N]] in to a very interesting perspective: “Die Verben, deren Stamm nicht auf (b), (d), (g), (z) und (ŋ) auslautet, bilden etwa 90% des Korpus der Zusammensetzungen mit dem Verbindungsmorphem *-(-en^A)-*.” [i.e. Verbstem followed by Ø]¹⁰. This simple observation exposes Wurzel’s (1970) approach of a general schwa epenthesis and subsequent deletion - in **more** than 90% of examples, since some of the verb stems ending in /b, d, g, z, ŋ/ will not retain schwa either - as flawed.

Still, Žepić’s analysis is relatively short, only deals with lexicalised data, and only describes the phonotactic environment for schwa retention. Žepić does not go into any kind of morphological argumentation, does not comment on the homophony of nouns and verb stems in some examples (even though some of his examples are arguably nominal compounds, e.g. *Speise-kammer*, semantically denoting a place where food is stored, not eaten) and gives no reason for advocating schwa ‘retention’ over epenthesis even though his analysis indicates that the opposite view would be much more appropriate.

The account of schwa in [[Vstem] __ [N]] compound formations in Fleischer (1974) is very brief, and like Žepić’s once again incorporated in the section on linking elements in nominal compounds. He observes: “Endet die erste Konstituente auf -b, -d, -g, -ng, -s, zeigt sich eine mehr oder weniger starke Variation; endet sie jedoch auf einen stimmlosen Konsonanten

¹⁰ ‘The verbs whose stems do not end in (b), (d), (g), (z) and (ŋ) comprise 90% of the corpus of compounds with the linking element *-(-en^A)-*.’ [i.e. the verb stem followed by Ø].

oder auf Nasal bzw. Liquida, fehlt das Fugen *-e* fast durchgängig”¹¹ (1974:129). The fact that Fleischer, following Žepić (1970), also cites the velar nasal as one of the triggers is substantiated by numerous examples (see Table (1) below) - and it also questions the integrity of the group of voiced obstruents as the sole trigger of schwa epenthesis. It remains to be seen if this particular claim can be substantiated, but the fact is that a nasal would considerably weaken any argument for epenthesis of schwa in post-voiced-obstruent position for reasons of voicing alone, since the velar nasal would not devoice without schwa¹², and hence, phonologically speaking does not require its presence. Fleischer’s observation otherwise is quite cautious in that he does not advocate a schwa insertion in the environment he determines, but rather notes an ‘instability of schwa’ after specific sounds, in contrast with an otherwise clearly defined absence of schwa elsewhere. While this caution is laudable, and appropriate, as the data below will show, it is not sufficient when productivity and novel formations are analysed (see III.4 below).

The problem of schwa epenthesis in [[Vstem] __ [N]] compounds is of particular interest, because intuitions about the presence or absence of schwa in the juncture position are very strong; a native speaker can detect a misplaced schwa (e.g. **Treib-e-holz* ‘drift wood’, **Schreib-e-tisch* ‘writing desk’) as well as a missing one (**Sterb-hilfe* ‘euthanasia’, **Lieg-wiese* ‘lawn’), and would undoubtedly class any of these formations as ‘wrong’, even when the forms do not follow the rule, for example in *Treibholz*. These rather strong feelings about the well-formedness of a form are quite different from other phenomena involving an unstable schwa (e.g. 1st Sg Pres *ich lauf(e)* or the Dat Sg, e.g. *dem Kind(e)*) where a certain amount of optionality is given - so that the schwa-less form may be classed as ‘dialectal’ or ‘informal’¹³ rather than ‘ill-formed’. However, the ‘hypothetical’ formations in III.4 are

¹¹ ‘If the first constituent ends in *-b*, *-d*, *-g*, *-ng*, *-s*, there is a more or less strong variation; but if it ends in a voiceless consonant, or a nasal or liquid, the linking *-e* is missing almost without exception.’ [My emphasis]

¹² In Northern German, it would devoice, e.g. *Ding* ‘thing’: [dɪŋk]. Cf. also Wiese (1996a:202).

¹³ Or, in the case of the Dat. Sg., as appropriate - while the form containing schwa tends to be interpreted as ‘overly’ correct.

quite markedly different in this respect (as well as many others) - they are not lexicalised (and therefore not firmly established) forms, but rather new formations which exhibit a certain scope of variability.

I will now proceed to consider the various potential influences or triggers for the epenthesis of schwa in turn. Having presented the data (and its problems) in III.3, I will be looking at phonotactic evidence in III.3.1, prosodic influences in III.3.2, morphological considerations in III.3.3 and potential semantic criteria in III.3.4. All these approaches will be considered only very briefly to show the principal ideas, since the lexicalised data does not lend itself to being analysed in this way. I have also collected a corpus of potential ‘new’ formations in III.4, which will serve to test the phenomenon for productivity and also allow the analysis to extend beyond the range of fixed forms in Tables (1) and (2), which are much less prone to variations in terms of schwa epenthesis because of their lexicalisation and may be potentially obscured.

III.3 The lexicalised data

In table (1) I give examples of those cases that appear to be the least problematical; these are the ‘default’ cases (i.e. the ‘elsewhere’) in the initial consideration of schwa epenthesis. While schwa seems to be predominantly inserted after voiced obstruents, it is quite clearly the case that such an insertion is highly exceptional in all other instances:

(1) Table of ‘elsewhere’:

	without schwa	with schwa
/f/	<i>Rauf-bold; Kauf-lust; Schleif-stein</i>	<i>Ausruf-e-zeichen, -satz</i>
/h/	impossible, because not found in syllable rhymes; cf. <i>Seh-kraft</i> etc.	

	below	
/k/	<i>Streck-verband; Strick-nadel</i>	
/l/	<i>Heil-mittel; Mal-stift</i>	
/ə/	<i>Segel-verein; Kegel-abend</i>	
/m/	<i>Schwimm-flügel, -bad</i>	
/n/	<i>Turn-schuh, -verein, -saal, -übung; Mahn-mal</i>	
/ŋ/	<i>Spring-schmur, -seil; Sing-spiel, -vogel; Spreng-körper, -stoff</i>	<i>Düng-e-mittel; Häng-e-lampe, -brücke, -matte; Aushäng-e-kasten; Vorhäng-e-schloß</i>
/ŋk/	<i>Senk-fuß; Trink-wasser; Denk-kraft</i>	
/p/	<i>Stepp-schuh</i>	
/pf/	<i>Hüpf-seil Hupf-dohle (obscured, exocentric)</i>	
/r/	<i>Hör-gerät; Bohr-maschine</i>	
/ər/	<i>Klammer-affe, -braut; Jammer-lappen; Wander-karte</i>	
/s/	<i>Eß-saal, -zimmer, -besteck; Reiß-zahn; Freßsucht; Gieß-kanne</i>	
/ʃ/	<i>Wasch-weib, -anlage; Täusch-manöver; Dresch-flegel</i>	<i>Hasche-spiel (Fleischer, 1974:93)</i>
/ts/	<i>Tanz-stunde, -saal, -partner (ambiguous noun/verb); Stütz-pfeiler; Spreiz-fuß; Setz-kasten</i>	
/tʃ/	<i>Klatsch-base</i>	
/ç/	<i>Sprech-übung; Brech-eisen</i>	<i>Aus-weich-(e)-stelle</i>
/çt/	<i>Leucht-turm; Beicht-stuhl (noun?)</i>	
/x/	<i>Lach-sack, -fältchen, -krampf; Mach-art; Tauch-station; Rauch-verbot; Koch-topf; Ein-mach-glas</i>	<i>Fest-mach-e-boje (Žepić, 1970:69) Rein-(e)-mach-(e)-frau (obsc.)</i>
/t/	<i>Bet-schwester; Leit-faden; Gleit-flug, -laut; Brat-pfanne * Halt-verbot Reit-bahn, -gerte, -hose</i>	<i>Wart-e-halle, -saal, -liste, -zeit, -zimmer; Halt-e-stelle, -verbot, -punkt, -linie; cf. Anhalt-e-verbot etc. (definitely verb)</i>
/k/	<i>Hack-fleisch Back-ofen; Deck-blatt</i>	<i>Hack-e-beil Hack-e-peter (obscured) Drück-e-berger (obscured) Hink-e-fuß</i>
/a/		
/e:/	<i>Geh-steig, She-hilfe, Dreh-zahl</i>	
/ɛ:/	<i>Mäh-maschine</i>	
/i:/	<i>Zieh-vorrichtung</i>	
/o:/	<i>Droh-brief</i>	
/u:/	<i>Tu-wort</i>	<i>Ruh-e-stätte (noun)</i>

As can be seen from this overview, the data behaves largely as expected. The majority of examples in table (1) do not take a linking element in the environment $[[Vstem] __ [N]]$, as the insertion hypothesis predicts. There are, however, exceptions, some of which will prove more problematic than others. /ə/ after the velar nasal, for example, is not predicted by the rule which proposes insertion after voiced obstruents, and yet there are a few examples which suggest that this environment also seems quite productive. Also, the /ə/ after /t/ in the examples given seems to go beyond mere lexical exception - but whether or not this is a real tendency or an accident can only be established on the basis of productive, non-lexicalised data in III.4 below. *Haschespiel* ‘catch’ (the game) and *Rein(e)mach(e)frau* ‘cleaning lady’ are very probably lexical exceptions.

In table (2) I have collected examples which pose more severe problems with the general statement ‘insert schwa after voiced obstruents’, simply because there are quite a few examples where there is no schwa epenthesis even though the right environment seems to be given, but also because there are some forms which can vary. Neither of these two facts have so far been sufficiently explained.

Table (2)¹⁴ /ə/ after voiced obstruents and counter-examples:

	without schwa	with schwa
/p/ ¹⁵ ; /b/	<i>Kleb-stoff, -stift, -streifen</i>	<i>Kleb-e-streifen, -band, -vorrichtung</i>
	<i>Leb-tag, -zeiten</i> (Žepić, 1970:69)	<i>Leb-e-mann, Leb-e-wesen</i>
	<i>Schreib-tisch, -schrift, -utensil</i>	<i>Einschreib-e-brief</i>
	<i>Erb-masse, -anlage, -anspruch, -folgekrieg</i>	! <i>Erb-en-beratung</i> etc. /ə/ only retained in noun plural (see footnote 16 below)
	<i>Treib-holz, -stoff, -mittel, -sand;</i>	

¹⁴ This table just aims to give an impression of the possibilities of the data; it is not complete.

¹⁵ I have retained the voiceless variant in the table since this is what remains in the juncture position if /ə/ is not inserted.

	<i>Reib-fläche, -eisen</i>	<i>Reib-e-kuchen, -laut</i>
	<i>Web-rahmen, -stuhl</i>	<i>Web-e-maschine (Žepić, 1970:70)</i>
	<i>Tob-sucht</i> (obscured)	
	<i>Lob-gesang</i> (<i>Lob</i> here: noun)	*?
	<i>Heb-amme</i> (obscured)	<i>Heb-e-kran, -figur, -werk</i>
	*	<i>Werb-e-agentur, -vermittlung, -texter, -trommel</i>
	*	<i>Sterb-e-hilfe, -bett</i>
	*	<i>Hab-e-nichts</i> (see /g/ below; exocentric)
	<i>Raub-angriff, -überfall</i> (<i>Raub</i> here: noun ?); <i>Raub-tier, -vogel; -katze</i>	*?
	<i>Schieb-kasten</i> (Žepić, 1970:70)	<i>Schieb-e-dach, -fenster</i>
	*	<i>Schweb-e-balken, -bahn</i>
/t/; /d/	<i>Zünd-holz, -schlüssel, -kerze</i>	
	<i>Bind-faden</i>	<i>Bind-e-draht, -haut, -strich</i>
	<i>Schneid-bohrer, -brenner</i> (both dvandvas), <i>-eisen</i>	<i>Schneid-e-tisch, -zahn, -mühle</i>
	<i>Sied-fleisch</i> (Bavarian)	? <i>Sied-e-fleisch</i> <i>Sied-e-punkt, -temperatur</i>
	<i>Red-seligkeit</i>	<i>Red-e-pult, -duell, -gewandtheit</i>
	Only nominal: (<i>Bad_N-installateur, -fliese</i>)	<i>Bad-e-hose, -ort, -wanne, -salz, -anstalt, -meister</i>
	*	<i>Lad-e-rampe, -fläche, -gut, -gerät; Ablad-e-platz</i>
	*	<i>Meld-e-amt, -frist, -stelle; Anmeld-e-frist</i>
	Only nominal: (<i>Land_N-haus</i>)	<i>Land-e-bahn, -platz</i> (Verb)
	*	<i>Werd-e-gang</i>
	? <i>Send-bote, Send-brief</i> (Žepić, 1970:70)	<i>Send-e-folge, -reihe, -zeit</i>
/k/; /g/	<i>Schlag-baum, -loch, -sahne, -ader</i>	<i>Schlag-e-tot</i> (obscured; exocentric)
		<i>Pfleg-e-mutter</i>
	<i>Trag-zeit</i> <i>Trag-fläche, -festigkeit, -kraft, -riemen, -korb, -werk</i>	<i>Trag-e-zeit</i> (both in Duden)
	<i>Steig-bügel, -eisen, -höhe, -rohr</i>	<i>Absteig-e-quartier</i>
		<i>Feg-e-feuer</i>
	<i>Säug-amme</i>	<i>Säug-e-tier</i>
	<i>Saug-flasche, -heber</i> (dvandva), <i>-kraft, -napf, -rohr,</i>	
	without /ə/: would be noun	<i>Berg-e-kran</i>
	<i>Wag-stück;</i> cf. <i>Wag-halsigkeit</i>	<i>Wag-e-stück, Wag-e-mut;</i> cf. <i>Wag-e-halsigkeit</i> (both

		in Duden)
	*	<i>Nag-e-tier, -zahn</i>
	*	<i>Präg-e-presse, -maschine</i>
	*	<i>Säg-e-werk</i> ¹⁶
	*	<i>Lieg-e-stütz, -wiese, -stuhl</i>
	<i>Leg-henne</i>	<i>Leg-e-henne</i> <i>Ein-leg-e-sohle</i>
		<i>Taug-e-nichts</i> (obsc; exocentric)
		<i>Schweig-e-geld, -pflicht</i>
		<i>Folg-e-zeit</i>
		<i>Zeig-e-finger</i>
/s/; /z/	<i>Les-art</i>	<i>Les-e-saal, -abend, -</i> <i>lampe, -ratte</i>
	<i>Blas-musik, -instrument, -rohr</i>	<i>Blas-e-balg</i>
		<i>Lös-e-geld, -mittel;</i> <i>Auslös-e-hebel</i>
		<i>Braus-e-pulver, -kopf</i>
		<i>Speis-e-saal, -wagen;</i> <i>-kammer (noun?)</i>
		<i>Reis-e-lust, -gepäck</i> <i>(noun?)</i>

The difficulties posed by the data become obvious in this table; even though the amount of /ə/ insertions is much larger than in table (1) (as predicted by the insertion hypothesis), the amount of examples where /ə/ is inserted as opposed to those where it is not inserted is roughly equal. This is not a very good result, considering the hypothesis was that in this environment of voiced obstruents, /ə/ should - presumably exceptionlessly - be inserted in the juncture of [[Vstem] __ [N]]. The data supports this only up to a point, and it would be fair to argue that the ‘counterexamples’ themselves are so numerous that they form a group by themselves (and thus warrant a different insertion hypothesis?). Furthermore, the group of voiced obstruents is, strictly speaking, not fully represented; /v, ʒ/ do not feature at all. This is due to the lack of German verb stems which end in /-v/ or /-ʒ/: they don’t occur, and hence neither trigger, nor fail to trigger, the insertion. Considering that it would appear that the insertion hypothesis will have to be modified anyway to exclude some candidates of the group of voiced obstruents, and to admit some triggers which are not from the group, there

¹⁶ This verb stem, as well as *Liege-* etc, has a homophonous noun. As will be discussed in detail in III.4, and also in IV.3.15, if nominal semantics is sought for these examples, the nominative plural inflection (-n) needs to be inserted. If it is not inserted, the interpretation is most likely to be that of a verb stem.

is no need for additional subrules which specifically exclude /v/ from the group of voiced obstruents.

Having looked at the data, it is clear that previous analyses have merely recognised the broad generalisation, but have failed to account for the perhaps surprising patterns in the large number of counterexamples. In order to arrive at an analysis that explains most of the cases presented above, and that is at the same time not too far fetched, I would like to consider the following general questions before setting out to evaluate various approaches in turn. What needs to be established in a successful analysis are the following points:

1. Is the unrestricted insertion of schwa in [[Vstem] __ [N]] compounds the default, as suggested in Wurzel (1970:104)? This would leave an awkward (and by no means natural) group of all non- [voiced obstruents] plus /v, ʒ/ which behaves in an exceptional way, and is therefore clearly not an approach which would be easy to restrict. The fact that the class to which schwa insertion does not apply is so unnatural seems to suggest that this may be the default, rather than vice versa.

2. Is the general insertion of schwa the 'exception' (leaving all other cases as default)?

This must mean that schwa is inserted only in a specified environment, i.e. after /b, d, g, z, ʒ/ (and exceptionally after /t, k, x/ which needs to be explained). At first glance, this proposition appears much easier to constrain than the first.

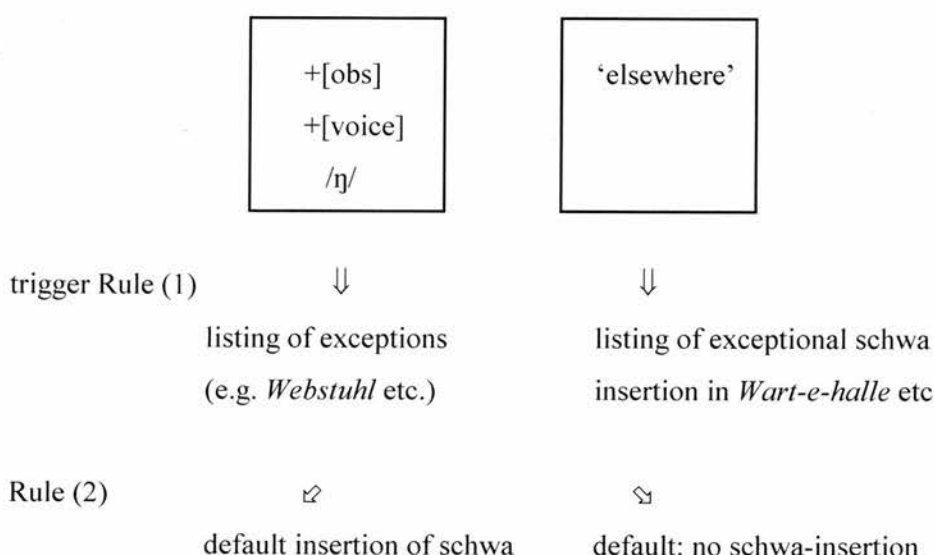
3. Within proposition 2.: Is the insertion of schwa specifically after /b, d, g, z, ʒ/ the default case? Considering the initial hypothesis of the insertion of schwa in this specific environment, this would seem a viable approach, which leaves all instances with no schwa after /b, d, g, z, ʒ/ to be explained - sadly a rather large group in the lexicalised data.

4. Is the insertion of schwa after /b, d, g, z, ɳ/ the exception? In this case: Are the rules which insert schwa in this environment homogeneous?

5. Hypothesis: The default is: no schwa is inserted without trigger in the environment [[Vstem] __ [N]]. The rules for schwa insertion must be specific. Reasons for their application may be phonological (after voiced obstruents, possibly also after /ɳ/¹⁷); phonotactic (is the following onset relevant?); metrical (syllabification); morphological (verb or noun?) or semantic (ditto).

An overview of the questions raised in 1.-5. can thus be made:

Step (1): two possible environments:



OR

The default is that there is no schwa insertion in the environment [[V stem] __ [N]], and there is extensive listing, and some specific rules for those cases where schwa insertion does occur.

¹⁷ It should be noted that there is an independent motivation to analyse the velar nasal [ɳ] as /ng/, which would solve the problem of the heterogeneous environment in which schwa occurs. The motivation for this is much stronger in German than in English, since German has final devoicing e.g. in Northern German *Ring* 'ring' as [rɪŋk].

III.3.1 Phonotactic Factors

A phonotactic approach (e.g. Žepić, 1970) considers the possibility that the schwa insertion in the context of $[[Vstem] __ [N]]$ might be triggered by surrounding phonological material. The insertion hypothesis so far is based on phonotactic considerations alone, which is one of the reasons why it is not successful as it stands. The restriction of ‘after voiced obstruents’ again needs to be clarified in this particular context: it means /b, d, g, z/, but not /v, ʒ/ - simply because there are no German verbs ending in /-vən/ or /-ʒən/, and it also needs to incorporate the velar nasal /ŋ/. As is clear from both tables above, the distinction ‘insert schwa after voiced obstruents, but not elsewhere’ is insufficient in two respects; one, because there are examples (albeit only a few) where schwa is inserted after a voiceless obstruent, e.g. after /t/ and /k/: *Wart-e-halle*, *-liste*, *-saal*, *-zeit*, *-zimmer*, *Halt-e-stelle*, *-bucht*, *-gurt*, *-linie*, *-verbot* (but cf. *Halt-verbot*), and the obscured: *Drück-e-berger*, *Hack-e-peter*; and two, more strikingly, because of the extensive list of schwa-less forms after voiced obstruents in table (2). As mentioned in III.2 above, I would like to assume the preceding phonotactic environment as a broad generalisation, and as one of the primary causes which trigger or prevent the epenthesis. It is however not sufficient on its own - so that it seems reasonable to suggest that there must be other triggers or constraints which follow this first one, but which are of a different (i.e. non-phonotactic) nature.

It is also important to emphasise at this point that the segment which **follows** the potential insertion-point for schwa is of no consequence; there do not appear to be any generalisable phonotactic restrictions which would merit a detailed discussion. I have found some examples where such restrictions appear to be a viable option (e.g. *Bind-faden* vs. *Bind-e-draht*, not: **Bind-draht*), i.e.

$$\emptyset \rightarrow \text{ə} / \dots C_\alpha __ C_\alpha \dots \text{ for } [[Vstem] __ [N]]$$

This rule would also apply to **Schneid-tisch*, **Schneid-zahn* etc. An assumption would thus be to ban syllable constructions of the following kind:

Coda	Onset		Coda	Onset
\	/		\	/\
* ... t	t ...		* ... t	t s ...

However, there is a sufficiently large number of examples which contradicts this claim, both in these specific compound formations, as well as elsewhere; e.g. *Leucht-turm*, *Erb-biologie*, *Trink-kanne*, *Sauf-fimmel*, *Wasch-schüssel* etc. Such a constraint therefore does not seem to exist beyond a mere tendency.

Overall it becomes obvious that phonotactic restrictions, albeit helpful in establishing a primary set of triggers for schwa epenthesis in $[[Vstem] __ [N]]$, cannot exhaustively provide all rules and constraints that are required to determine the exact environment of the insertion in question. Other factors will have to be taken into account in order to narrow the selection down from the initial phonotactic factors.

III.3.2 Prosodic Factors

Here, patterns in syllable structure are tested to see if they could be motivating factors in the insertion of schwa in the environment $[[Vstem] __ [N]]$. As pointed out above, voiced obstruents can only occur in syllable-initial position and /ə/ epenthesis adds the extra syllable to which the obstruents can become the onset. If schwa epenthesis did not occur, the obstruents could not be voiced under any circumstances, because they would automatically be in the rhyme of the syllable - for the simple reason that syllabification across $V] __ [N$ is impossible. Therefore, onset formation also is not possible across this divide, which is why a voiced obstruent devoices unless it can form an onset with an inserted schwa; cf. Giegerich (1992:142) on the effect of the '[' boundary on syllabification: "... no syllabification takes place across this kind of morphological boundary."

a schwa. See III.4, group (5) below on problematical examples *ordnen* etc., i.e. cases where schwa alternates within the verb stem.

SS-type formations are obviously schwa-less. They do however exist in numbers too large to discount, which is contrary to the claim whereby schwa epenthesis would create a 'preferred structure'. What is even more striking is that in the first group where schwa insertion would be possible and / or even preferable on phonotactic grounds as well, there is also a large number of examples without schwa.

However, there may be good reason to assume that while syllable shapes alone are not sufficient as motivating factors for schwa insertion, in conjunction with a closer analysis of the segmental make-up of the syllable, they could be contributory. For example, in cases where the S syllable is made up of ...VC (e.g. *Heb-*), or ...VCC (*Sterb-*) schwa epenthesis is much more likely to follow than after ...V: (*Seh-*). In short, schwa epenthesis seems to be particularly desirable if the result is to transform a coda into an onset, by establishing a new nucleus, e.g. *Ster.be.-*, *He.be.-*; i.e. the insertion of schwa leads to the formation of what is universally assumed to be the preferred, most common and generally 'optimal' syllable shape, and, as has been observed before, schwa insertion also prevents devoicing. This does not occur in post-vocalic positions, i.e. we seem to be dealing with a prosodic trigger and a phonotactic constraint on it.

Of course, there are also many counterexamples to this rather convenient claim, i.e. everything from columns two and three in table (a). What is interesting to observe in these examples is that the 'optimal' syllable shape may not be formed via schwa epenthesis 'at all cost'. There is, for example, a range of words which prefer to fill the onset position with the glottal stop /ʔ/ rather than with the preceding consonant, e.g. *Erb-anlage*, *Treib-eis*, *Schreib-improvisation*, *Reib-oberfläche*, *Schreib-utensil*: **Er.ban.la.ge*, **Trei.beis* etc. (see above).

This means that the establishment of the preferred syllable shape is sensitive to morphological information and may not occur across morphological boundaries:

σ	σ σ σ	σ	σ	σ σ
/ \	^ ^ ^	^	/ \	^ ^

[*Erb*] [*anlage*], but not: * [*Er b*] [*anlage*]

What is at work here are a number of syllabification mechanisms which are unrelated to schwa epenthesis.

In the example *Les-art* ‘reading, version’ the filling of the nucleus with the following V of the noun stem is thus not permissible because syllabification across stems would lead to (1) the wrong interpretation of the voiceless obstruent /s/ as /z/ and (2) a possibly wrong interpretation of the compound as a whole, since the first stem would be unrecognisable */le:.zart/. We may thus conclude that the epenthesised schwa is strongly connected with the preceding stem (i.e. not only in phonotactic, but also morphological terms) and is **not** independent of it. This still does not explain why **Le.se.art* or **Steige.ei.sen* are not possible formations, while e.g. *Ba.de.ort* or *Mel.de.amt* are.

The important conclusion which can be drawn from the data however is that schwa insertion seems to occur in the following position: [[... ə] [...]] and **not** here: [[...] ə [...]]. This is interesting also with regard to the following chapter on linking elements in nominal compounds; if they can be proven to be inflectional affixes, they, too, will be located within the first bracket, rather than in the ‘juncture position’ between the two nouns. I will from now on use the more accurate notation of [[Vstem __] [N]] as opposed to the convention adhered to above, since all the evidence strongly suggests that schwa is attached to the verb stem, and does not somehow float in an equidistant position between the two elements in the compound.

However, some other generalisations can also be made:

1. It is not clear that it is preferable for the first element in a compound to be monosyllabic if it is a verb stem, e.g. *Brenn-*, *Heil*, *Spül-mittel*, cf. *Erb-gut*, *Web-stuhl*. This also does not at all depend on whether or not the second element (i.e. the noun) is monosyllabic too.
2. There is stress shift (“Trochaic Reversal”) in e.g. *'Anlage* - *'Erbanlage* (for an analysis see Giegerich (1985:141)); the same behaviour occurs with *-vorrichtung*, *-einrichtung*: *Steig-*, *Saug-*, *Schreib-* all exhibit trochaic reversal if left schwa-less. If schwa epenthesis occurs, no stress-shift takes place, cf. *Hebe-*, *Wende-*, *Lese-vorrichtung*. This phenomenon is likely to be connected to prosody, because the same circumstances also apply in nominal compounds: *Wend-ung-s-vorrichtung*, *?Heb-ung-s-einrichtung*. Therefore, it is the unstressed syllable which is created by the epenthesised schwa which seems to prevent trochaic reversal from happening.
3. As can be observed from the examples in the tables (1) and (2), e.g. in *Aus-ruf-e-zeichen*, *Vor-häng-e-schloß*, *Aus-weich-e-stelle*, *Ein-schreib-e-brief* the probability for schwa insertion is apparently increased by a prefix which attaches to the verb stem prior to the verb stem entering compounding. While motivation for schwa epenthesis here could be prosodic (to avoid SSS...), it may also be linked to morphological factors. I will return to examples of this kind in III.3.3 below.

III.3.3 Morphological Factors

Keeping in mind the difficulties of accounting for the presence of schwa in some of the formations in table (a) (assuming here that schwa epenthesis after voiced obstruents is **not** the default), it would be helpful if the morphological interpretation of some examples might offer an insight. Obviously, there are quite a few cases where the status of the category verb-stem of the first element is rather questionable, because of the existence of a homophonous noun. Taking as example *Tanz-stunde* ‘dance lesson’ or *Raub-vogel* ‘bird of prey’ (cf. III.1),

it is clear that there seem to be some examples where it is impossible to determine conclusively whether the A element in the compound AB is nominal or verbal; and there may not even be a need for this distinction at all.

There are, interestingly, numerous instances where this ambivalence is avoided **by the insertion of schwa** (*Bad-e-hose* 'swimming trunks', *Land-e-bahn* 'runway'). For these cases I think it could be argued successfully that the schwa serves the specific purpose of identifying the form as a verb stem - as opposed to the noun¹⁸. Alternatively, the verb stem may be **blocked** from appearing without the schwa if this were to cause a potential misinterpretation. If this claim can be substantiated, it will change the nature of the problem: we are no longer concerned with a mere schwa 'epenthesis' in the environment [[Vstem] __ [N]], but instead the schwa will come to be interpreted as morphological material within [[Vstem __] [N]] - rather than just a means to create preferred syllable structures. While this interpretation of the schwa may sound quite exciting in its importance, it is crucial to keep in mind the fact that the vast majority of verb stems which enter compounding, or indeed any other kind of word formation (cf. chapter II), do so without the schwa and are still readily recognisable as verb stems¹⁹. The schwa therefore cannot be the sole marker of the category verb stem, but rather a **relational** marker, which is only employed where it is necessary to mark the distinction between a verb stem and a homophonous noun.

There is an additional difficulty where the noun already ends in schwa. In such circumstances schwa may be (a) not inserted (i.e. perhaps blocked) (*Farb-tafel* 'colour plate', *Erb-masse* 'genetic make-up'), (b) inserted, potentially leading to ambiguity (*Red-e-pult* 'lectern', *Ruh-e-stätte* 'place of rest'); (c) inserted, 'meaning' the verb, with the additional option of a plural formation to unambiguously 'mean' the noun (*Lieg-e-wiese* 'lawn' vs. *Liegen-halle* 'hall of sunbeds'; *Säge-mühle* 'sawmill' vs. *Sägen-fabrikant* 'saw

¹⁸ This also makes sense semantically; *Land-e-bahn* has little to do with the noun *Land*, but is clearly based on the verb *landen*; same for: *Bade-*.

¹⁹ Unless, of course, there is a homophonous noun with which they can be confused.

producer'). However, while (c) seems to offer quite a neat explanation for the facts, one of the examples mentioned under (a) poses a problem. *Farb-tafel* 'colour plate' is easily distinguished as a [[N] [N]] from its [[Vstem _] [N]] counterpart *Färbe-fimmel* 'dye-craze', since the verb stem carries the umlaut. In this example, therefore, the presence of schwa alone would not lead to any ambiguity at all; *Farbe-* without umlaut could only be interpreted as having nominal semantics - and yet it is not an option (for more details on blocking constraints on schwa in the juncture position after nouns see chapter IV, section IV.3.15 below).

The fact that a plural is available to unambiguously 'mean' noun for this example is the only distinguishing capacity which is available for this example (*Farb-en-lehre* 'teaching of colours'). *Erb-* 'inherit or heir' however is quite different in that this is by no means clearly identifiable as either verb stem or noun within the compound, there are no forms available with schwa (on its own: **Erbe-*) - but there are some forms which are based on noun_{Plural} *Erben-*. Thus the plural here serves (just as for the examples in (c)) as the unambiguous signal that these examples are [[N] __ [N]] (both semantically and structurally), e.g. *Erb-en-gemeinschaft*.

It seems therefore, that the presence of schwa to signal 'verb stem' is not homogeneous in such cases where there is also a homophonous noun - in the cases of *Liege-*, *Säge-* it occurs without exception, while in *Erb-* it does not occur.

Similarly ambiguous are examples like *Wärm-e-pumpe* 'warmth-pump' vs. *Wärm-flasche* 'warming bottle', where again no concrete help is available to determine which one is verb or noun, since the noun ends in *-e* and both noun and verb are umlauted. However, while in *Wärmepumpe* we have most probably the noun, I would interpret the schwa-less form in *Wärmflasche* as the verb - mainly on a semantic basis; but perhaps also because schwa

epenthesis here would violate the higher ranked phonotactic rule ‘insert schwa in [[Vstem _] [N]] compounds only after voiced obstruents’. This may therefore actually be an example where the ‘missing’ schwa indicates the verb stem. Furthermore, the Nom. Pl. is not available for this example to indicate ‘nouniness’, because *Wärme* is not a count noun, and therefore cannot have a plural. See III.4 and IV.3.15 below for more such cases, productivity, and a possible generalisation.

A similar explanation may work for *Spiel-stunde* ‘play hour’ vs. *Spiel-e-sammlung* ‘game collection’; here, the verb stem and the noun are synonymous (i.e. the noun is without schwa); the formation that lacks the schwa is more likely to be the verb stem, while the schwa in *Spielesammlung* indicates the plural - and therefore the noun. Similarly (taking a productive example) *Spielfimmel* ‘play craze’ refers to the action, while *Spielefimmel* might indicate that the person has or collects games.

The main issue therefore is whether the indicated morphological evidence is sufficient to class all schwas in [[Vstem _] [N]] compounds as stem-forming. The two main arguments against this are the sheer number of examples which must be interpreted as verb stems but which don’t have the schwa, and the fact that there are other morphological operations which crucially apply to verb stems, but which lack the schwa. For example, it may be another question altogether whether the lack of schwa **before suffixation** should be considered relevant or not (*Les-e-saal* ‘reading room’, but: *les-bar* ‘legible’, *Les-ung* ‘reading’). It is interesting to note with a view to the arguments concerning the category ‘verb stem’ and affixation, that I argued (in chapter II, section II.5) that *les-* has to be interpretable unambiguously as a verb stem, because the affixes *-bar*, *-ung* etc. would otherwise not attach. If, then, *les-* can undergo some kind of invisible transformation from ‘root’ to ‘stem’, why should the same transformation in the building of a verb stem (i.e. the same category) in respect to compounding require a visible insertion of schwa? *Les-* in

lesbar is undoubtedly a verb stem, but then so is the same form in *Les-ung*, *Les-art* and *Lese-abend*. Here, the above arguments of schwa epenthesis as a means of distinguishing verb from noun cannot apply because there is no homophonous noun, and therefore a different explanation is required for these examples. Of course, the primary reason may well be assumed to lie in the fact that *les(e)* (i.e. with or without schwa) is undoubtedly a verb form, and there is no question of this ever being confused with the competing noun - simply because it does not exist. As one would expect, all equivalent examples from the table in III.3.4 behave in the same way (i.e. none have schwa before affixation), 'even' *sägbar*, an example which crucially requires the schwa in compounding. Some examples, however, are not eligible for *-bar* or *-ung* attachment, but this is due to the fact that they are intransitive rather than the question of whether or not there is a competing noun (e.g. **lieg-bar* etc., cf. II.5.2).

Schwa may also be inserted within the stem (rather than at the point of conjunction to the other form), e.g. 'calculate-' *Rechen-stunde* 'maths lesson', *-aufgabe* 'maths homework', *-maschine* 'calculator' etc. cf. *rechn-(en)*.: **Rechne-maschine*, **Rechnen-maschine* (cf. other regularities involving [+son] stems). Note that the preferred form has the appearance of *Rechen_N* 'rake', but despite homophony the semantics of the two words is so different that a misinterpretation is unthinkable. Similar behaviour is displayed by *zeichn-* 'draw-' cf. *Zeichen-stunde* 'drawing lesson', *-saal* 'art room', *-mappe* 'art portfolio' etc. (see III.4 (5) below).

As indicated in III.3.2, there is a remarkable number of examples which could have the schwa inserted, but don't - unless the verb stem has received a prefix prior to the compound formation, e.g. *Blas-musik* 'music for brass band' vs. *Auf-blas-e-puppe* 'blow-up doll' and *Mach-art* 'make, design' vs. *Fest-mach-e-stelle* 'mooring; fixing point'. There are various possible interpretations for this; (1) the prefix emphasises the 'verby' qualities of the first

element in the compound, which trigger the schwa insertion; or (2) the schwa epenthesis is here entirely prosodic; or (3) accidental. It may not be possible to resolve this issue even by analysing a range of examples which goes beyond lexicalised items, to test productivity and to establish patterns, simply because the prototype which novel formations are based upon will be linked to the lexicalised data.

Within the lexicalised data, there are numerous counterexamples to the claim that prefixation somehow triggers /ə/. There is the type [[[Prefix [V]] [N]], where the link between prefix and verb stem is extremely strong: [*Ver-steck*]- *spiel*, [*Ab-zähl*]- *reim*, [*Durch-lauf*]- *erhitzer*. Contrasting with this are examples of the kind [[[Adj] [V]] [N]], where the link between adjective and verb is relatively strong, but variable in some cases, cf. *Gefrier-fach* but: ?! *Lauf-ski*: *Tief-gefrier -fach*, *Fern-melde -satellit*, *Breit-walz -verfahren*, *Lang-lauf -ski*. A different kind of bracketing can be found in [[N] [[V] [N]]]: *Schuh-putz-zeug*, *Haar- färbe-mittel*, *Scheiben- wasch-anlage*, *Funk- sprech-gerät*, *Hallen-schwimm-bad*, *Bus- halte-stelle*, *Holz- bau-element*, *Reise- schreib-maschine*, *Winter-fahr-plan*. Compositional meanings of [[N] [V]] become gradually less acceptable: *Schuhe putzen*, *Haare färben ...?* *Hallen schwimmen*, ?? *Bus halten*, **Reise schreiben*, **Winter fahren*; the more this is the case, the stronger the semantic link between [[Vstem] [N]] becomes. Much rarer is the kind [[[Vstem][Vstem]] [N]]: [*Schluck* -[*impf*]- *stoff*]; *Schluck impfen*, *Impf-stoff*, but: **Schluck-stoff*. Ditto: [*Bau* - [*spar*] - *kasse*], *Schwimm* -[*lehr*] - *becken*, *Warn* - *blink* - *anlage* etc.

The one thing all these examples have in common is the fact that they behave exactly like their counterparts which are not prefixed in any way; most of them do not show schwa epenthesis, and those which do also have it in non-prefixed compounds (cf. *Halt-e-stelle* ‘stop’ and *Bus-halt-e-stelle* ‘bus stop’). Arguably, the difference between prefixed forms and non-prefixed forms only becomes clear in non-lexicalised data; compare

Machart vs. *Festmachestelle*

Saugkraft vs. *Aussaugekraft*

Blasmusik vs. *Aufblasepuppe*

Steigbügel vs. *Absteigequartier*

Raub-einrichtung vs. *Ausraubeeinrichtung*, *-drang*

Schlag-stock vs. *Nachschlagefimmel*

Overall, however, the stock of available data is too small, too varied and far too much influenced by lexicalised compounds to allow any kind of valid generalisation with regard to this group of examples.

III.3.4 Semantic arguments

In a way, semantic criteria are inseparably intertwined with the preceding section on morphological factors, and the main argument has thus been pre-empted. In some cases, the schwa-insertion is necessary to emphasise discrepancies of the verb stem with other, similar sounding nouns: *Reis-e-geld* ‘travel money’- **Reis-geld*; because of *Reis-papier* ‘rice paper’ or even *Reiß-zwecke* ‘drawing pin’. However, in some instances verb stem and noun may be homophonous, but semantically so far apart that a misinterpretation of one as the other is unthinkable. In section III.4, based on productive data, an analysis will be attempted which deals specifically with the question of blocking where such a misinterpretation is possible.

III.4 Evidence from new formations

In order to gain some insight into the extent of productivity of the phenomenon of schwa insertion in the [[Vstem _] [N]] compound formation, and also to escape the risk of getting confused by lexicalised and obscured forms, I decided to use a list of non-existing (but theoretically possible) formations involving a large number of examples (for details

concerning the collection of the data, see III.1.1). The data is organised into two main groups, namely those where the verb stem ends in /b, d, g, z/²⁰ and would thus be expected to be susceptible to schwa insertion, and the much larger group of ‘all others’, where we would expect to find no or very few epenthesised schwas. The list is further sub-divided into those verb stems that (1) have a synonymous noun (which does **not** end in schwa); (2) have a synonymous noun that ends in schwa; (3) have no equivalent noun²¹; (4) potentially have a synonymous, schwa-less noun, but are distinct via umlaut; (5) show exceptional behaviour in that an alternating schwa may create a noun/adjective.

The ‘test’ is to attach to each of these verb stems a number of nouns. Based on patterns in the lexicalised data, what we would expect to find is very few schwa insertions in the ‘elsewhere’ category - but perhaps some where the schwa serves to establish the distinction between noun and verb stem. It will be interesting to find out if the insertion hypothesis which predicts productive insertion of schwa after verbs stems ending in voiced obstruents (irrespective of any semantic considerations) is correct.

Below is a list of possible nouns which can be attached to the verb stems below. Some of these nouns were chosen specifically because they unambiguously determine the semantics of the A element as verbal; e.g. *-drang*, or *-vorrichtung*; while others allow for both a verbal or nominal A element, e.g. *-fimmel*, *-stunde*:

-drang ‘urge’
-einrichtung ‘set-up, installation’
-fimmel ‘craze’
-fixierung ‘fixation, obsession’
-haus ‘house’
-muster ‘pattern’
-stunde ‘hour’
-tisch ‘table’

²⁰ The velar nasal is treated separately on account of the fact that it is not a voiced obstruent, and thus not part of the initial natural group which form the environment for the schwa insertion (but see footnote 17 above on /ng/).

²¹ I disregard all other possible formations which require further affixation, such as *-en*, *-er*, *-ung* etc.

- vorrichtung* ‘device’
- unternehmen* ‘enterprise, project’
- zeit* ‘time’
- zimmer* ‘room’

/b, d, g, z/ expecting schwa		all others expecting NO schwa	
(1a) with homoph. noun (schwa-less)	(3a) no noun equiv.	(1b) with homoph. noun (schwa-less)	(3b) no noun equiv.
<i>grab-</i>	<i>geb-</i>	<i>schlaf-</i>	<i>helf-</i>
<i>raub-</i>	<i>heb-</i>	<i>kauf-</i>	<i>werf-</i>
<i>bad-</i>	<i>schieb-</i>	<i>lauf-</i>	<i>häng-</i>
<i>leid-</i>	<i>schreib-</i>	<i>ruf-</i>	<i>bring-</i>
<i>bild-</i>	<i>kleb-</i>	<i>koch-</i>	<i>spring-</i>
<i>schlag-</i>	<i>tob-</i>	<i>rauch-</i>	<i>sing-</i>
<i>sieg</i>²²-	<i>meld-</i>	<i>fisch-</i>	<i>mäh-</i>
<i>gras-</i>	<i>find-</i>	<i>heirat-</i>	<i>mach-</i>
<i>kreis-</i>	<i>jag-</i>	<i>duft-</i>	<i>brech-</i>
<i>schmaus-</i>	<i>nag-</i>	<i>verzicht-</i>	<i>stech-</i>
<i>berg-</i>	<i>trag-</i>	<i>arbeit-</i>	<i>nasch-</i>
	<i>feg-</i>	<i>streit-</i>	<i>wasch-</i>
	<i>bieg-</i>	<i>halt-</i>	<i>lausch-</i>
	<i>leg-</i>	<i>zelt-</i>	<i>tauch-</i>
	<i>steig-</i>	<i>wert-</i>	<i>zieh-</i>
(2a) noun with schwa	<i>saug-</i>	<i>last-</i>	<i>steh-</i>
<i>salb-</i>	<i>säug-</i>	<i>rast-</i>	<i>blüh-</i>
<i>prob-</i>	<i>trag-</i>	<i>bett-</i>	<i>back-</i>
<i>schweb-</i>	<i>ras-</i>	<i>blut-</i>	<i>schmeck-</i>
<i>reib-</i>	<i>les-</i>	<i>blick-</i>	<i>pflück-</i>
<i>erb-</i>	<i>nies-</i>	<i>streik-</i>	<i>welk-</i>
<i>glaub-</i>	<i>lös-</i>	<i>spiel-</i>	<i>melk-</i>
<i>Schraub-</i>	<i>dös-</i>	<i>grill-</i>	<i>denk-</i>
<i>red-</i>		<i>film-</i>	<i>trink-</i>
<i>Schmied-</i>		<i>form-</i>	<i>wink-</i>
<i>weid-</i>		<i>föhn-</i>	<i>mal-</i>
<i>erd-</i>		<i>teer-</i>	<i>stehl-</i>
<i>end-</i>		<i>bau-</i>	<i>schwimm-</i>
<i>wend-</i>		<i>reiz-</i>	<i>wohn-</i>
<i>klag-</i>		<i>salz-</i>	<i>brenn-</i>
<i>folg-</i>		<i>tanz-</i>	<i>lern-</i>
<i>schling-</i>		<i>schmerz-</i>	<i>turn-</i>
<i>sorg-</i>		<i>blitz-</i>	<i>schlepp-</i>
<i>geig-</i>		<i>handel- etc.</i>	<i>klär-</i>
<i>säg-</i>		<i>puder- etc.</i>	<i>spendier-</i>
<i>frag-</i>			<i>blondier-</i>
<i>lieg-</i>		(2b) noun with schwa	<i>isolier-</i>

²² All bold forms (verb stems with a synonymous schwa-less noun) use schwa to form the plural of this noun. All examples which in addition to this require umlaut are not marked (e.g. *Koch* - *Köche*).

<i>lüg-</i>		<i>schärf-</i>	<i>dominier-</i>
<i>reis-</i>		<i>straf-</i>	<i>schmor-</i>
<i>speis-</i>		<i>pfeif-</i>	<i>spür-</i>
<i>braus-</i>		<i>tauf-</i>	<i>rülps-</i>
<i>brems-</i>		<i>wach-</i>	<i>hops-</i>
		<i>zech-</i>	<i>gieß-</i>
		<i>spuck-</i>	<i>schieß-</i>
		<i>schmink-</i>	<i>freß-</i>
		<i>kühl-</i>	<i>beiß-</i>
		<i>eil-</i>	<i>fast-</i>
		<i>quell-</i>	<i>reit-</i>
		<i>perl-</i>	<i>kau-</i>
		<i>spül-</i>	<i>verdau-</i>
		<i>stimm-</i>	<i>box-</i>
		<i>wärm-</i>	<i>seufz-</i>
		<i>trän-</i>	<i>heiz-</i>
		<i>pump-</i>	<i>setz-</i>
		<i>schipp-</i>	<i>nutz-</i>
		<i>wipp-</i>	
		<i>knosp-</i>	(4) umlaut distinguishes noun from verb stem
		<i>beicht-</i>	<i>kämpf-</i>
		<i>falt-</i>	<i>lüft-</i>
		<i>ernt-</i>	<i>wähl-</i>
		<i>flöt-</i>	<i>drück</i>
		<i>bürst-</i>	<i>läut-</i>
		<i>wett-</i>	<i>häut-</i>
		<i>hex-</i>	<i>wüt-</i>
		<i>beiz-</i>	<i>töt-</i>
		<i>walz-</i>	<i>stürz-</i>
		<i>pflanz-</i>	<i>zähl-</i>
		<i>spitz-</i>	
		<i>petz-</i>	(5) schwa alternates
			<i>regn-</i>
			<i>ordn-</i>
			<i>atm-</i>
			<i>zeichn-</i>
			<i>trockn-</i>
			<i>rechn-</i>
			<i>widm-</i>
			<i>ebn-</i>

Evaluation of potential formations from the table:

(1a) The data in this column comprises verb stems ending in (potentially) voiced obstruents /b, d, g, z/. All examples here also have a homophonous (schwa-less) noun, e.g. *bad*_{Vstem} ‘to bathe’ = *Bad*_N ‘bath’. Based on previous observations, what we would expect to find here is

insertion of schwa wherever unambiguous verb semantics is required, and no schwa (or possibly Gen. Sg. or Nom. Pl. inflection) where noun interpretation is sought. Schwa epenthesis ought to be exceptionless considering the phonotactic environment.

Bade-fixierung, -drang, -fimmel, -stunde 'bathing-'

Schlage-fimmel, -fixierung 'hitting-'

Siege-fimmel, -drang 'winning-'

Grase-einrichtung, -muster, -stunde 'grazing-'

Berge-einrichtung, -lampe, -drang etc. 'rescue-'

For northern German / standard German²³ speakers, all these verb stems will have a schwa epenthesis in compound formations, almost without exception, provided verbal semantics is required for the outputs. The schwa here serves to signal the distinction between the noun in cases such as e.g. *Grab_N-stein, -kammer, -sammler* 'grave-stone, -chamber, -collector' etc. and the verb stem in new formations like *Grab-e_V-vorrichtung, Grab-e_V-fimmel* 'digging device, digging craze' etc. This means that the epenthesis schwa for all examples in (1a) is morphologically and semantically crucial, and by no means merely phonological, but otherwise 'empty' material.

From the ideas discussed previously, what one would have expected here is schwa epenthesis across the board; firstly, because the right phonological environment is given (post-voiced obstruent) and secondly - and more importantly - because the schwa here crucially serves as a distinct marker signalling the verb stem as opposed to the homophonous noun. For several reasons, this does not appear to be as exceptionless as hoped for.

²³ For speakers of southern German dialects (e.g. Swabian, Bavarian), Austrian and Swiss German, all these examples are most likely not to have a schwa at all - because in these varieties of German, the schwa is generally absent even in what I called above 'the lexicalised' items, e.g. *Bad-hose, -mantel* etc. However, some verb stems will even in these dialects carry the schwa, especially in those cases where an additional prefix is attached to the verb stem, thus setting an unambiguous signal that this is indeed the verb stem and not the noun, cf. [*Um-grab-e*]-*fimmel, -gebiet, ...*; [*Nach-schlag-e*]-*werk*; [*Ab-gras-e*]-*maschine*; [*Aus-raub-e*]-*drang* etc. cf. also III.3.3.

Some of these examples are quite firmly associated with one or even a few of their lexicalised compositions, so that it is quite possible, and also quite likely, that productive formations are created on the basis of these available analogies, e.g. lexicalised *Raub-tier* ‘predator’, *-katze* ‘big cat’, *-vogel* ‘bird of prey’ etc. → ?*Raub-einrichtung* ‘robbing installation’ (nb. trochaic reversal), or ?*Raub-e-einrichtung*, but definitely: *Aus-raub-e-einrichtung* (see footnote 23). The additional difficulty with word formation based on analogy is that it will even vary from speaker to speaker how strong the analogy’s influence is on new formations, and it will depend on how many lexicalised items of any one example the speaker is familiar with.

The particular problem with the example *Raub* is that in the lexicalised examples above it is semantically at best ambiguous, but even more likely to be nominal rather than verbal. This leads to the second observation regarding this group: some of the examples are so firmly associated with [[N] [N]] formations (this includes the above mentioned *Raub-*), that trying to establish a [[Vstem] [N]] compound can prove to be a very strange, if not impossible undertaking, e.g. *Leid-ens-weg*, ‘long ordeal’ *-zeit* ‘time of suffering’ → ?*Leid-en-s-fimmel* or ?*Leide-fimmel*.

The fact of the matter is that in many instances it simply does not matter particularly whether the A element in the compound is semantically a verb or a noun. In such cases, the semantics of the following noun are very important in establishing the nature of the preceding stem, e.g. *-vorrichtung*, *-drang*, *-fimmel* have a tendency to attach predominantly to verbs, so that with these examples, the schwa is more frequently found than with other nouns, compare *Gras-e-vorrichtung* ‘grazing device’, *Schmaus-e-drang* ‘feasting urge’, *Schlag-e-fimmel* ‘hitting craze’ with *Gras-muster* ‘grass pattern’, *Schmaus-tasche* ‘feast bag’, *Schlag-ring* ‘knuckleduster’; where the A elements in the latter will most likely be interpreted as nouns, while the former are unambiguously ‘verby’. It can, however, be firmly

established that for the data in (1a), schwa will be inserted in [[Vstem _] [N]] provided verbal semantics are required. Where the semantics is not completely clear or not important, insertion of schwa will depend on the availability of existing, lexicalised formations and how frequent or common they are.

(2a) This group again consists of verb stems ending in (potentially) voiced obstruents, which also have a homophonous noun, only here the homophonous noun ends in schwa; e.g. *geig*_{Vstem} ‘to play the fiddle’ vs. *Geige*_N ‘fiddle’. Based on previous observations, what would be expected in these examples is a much less stable occurrence of schwa compared to the data of column (1a), because even though the correct environment (after voiced obstruents) is still given, the schwa can here lead to ambiguities with the noun, while in the last group it served to establish the distinction. It is even possible, that the opposite of the initial hypothesis might be true for this group, namely that a missing schwa may serve to indicate the verb stem.

However, schwa seems to be quite stable in (2a), appearing in nearly all examples in the new formations where verbal semantics are indented, e.g.

Schweb-e-fixierung, -vorrichtung ‘hover-’
Reib-e-tisch, -vorrichtung ‘grating-’
Red-e-fimmel, -drang, -zeit ‘talking-’
Wend-e-vorrichtung, -fixierung, -zeit ‘turning-’
Schmied-e-stunde, -drang ‘forging-’
Klage-schrank, -tisch ‘accusing-’
Lieg-e-drang, -zimmer ‘lying-’
Reis-e-drang, -fimmel ‘travel-’

All instances of schwa insertion are apparently unhindered (and uninfluenced) by the fact that they simultaneously create synonyms nouns. What would in fact appear to be the case here is that **if** the nominal interpretations were desired, the plural form would be used in the compound, e.g. *Lügenfabrikant, Geig-en-schrank* etc. Note specifically that with these

examples it is not an option to lose the schwa (unlike, e.g. in *Schul-tasche*), so that schwa-less forms, too, would always be interpreted as verb stems²⁴.

Again, there are a few examples which may or may not take the schwa, notably *Brems*- 'brake' and *Schraub*- 'screw' (perhaps in analogy to *Brems-pedal* etc. and *Schraub-stock* etc.): ?*Brems-stunde*, -*fixierung*, -*fimmel* vs. *Brems-e-fimmel*; ?*Schraub-fimmel*, -*stunde*, -*drang* vs. *Schraub-e-drang*. Again there is the vague possibility that syllable structure may be relevant, compare *Brems(e)fimmel*, *Brems(e)drang* vs. *Brems-vorrichtung*, i.e. if the following noun is longer than two syllables, the schwa is more likely to be missing in those forms where it is not quite stable, while it is more likely to be present if the following noun consists of only one or two syllables. Overall, however, there are too few examples, and it is important to keep in mind that most cases exhibit a stable presence or absence of schwa in the appropriate semantic contexts.

Another interesting point to which I shall briefly return in (5) below is that in cases where the noun is homophonous but a completely different lexical item (as potentially in *bremsen*_V 'to brake' - *Bremse*_N 'the brake', but also: 'horse fly'; *brausen*_V '(of wind) to roar' - *Brause*_N 'sherbet', but also: 'shower' (coll.)), no further difficulties arise in distinguishing one from the other. The context will unambiguously establish which form is intended - and this intention is so strong in the speaker's mind that most speakers would have to think really hard about the existence of the homophonous form (and are quite often astonished to find that there is one) - simply because under the circumstances this seems rather far-fetched.

(3a) This group comprises verb stems which end in (potentially) voiced obstruents, but do not have a homophonous noun; consequently the issue of inserting the schwa to

²⁴ I would class *Erdball* 'globe' and *Endzeit* 'last days' as lexicalised and therefore exceptional. Both these examples may spawn schwalessly in new [[N] [N]], but are less likely to appear schwa-less in [[Vstem _] [N]].

disambiguate noun from verb does not arise. Reasons for having the schwa must therefore be of a phonological nature only.

Heb-e-fimmel, -drang ‘lifting-’
Schieb-e-vorrichtung, -tisch ‘shoving-’
Tob-e-zimmer, -stunde ‘romping-’
Kleb-e-drang, -muster ‘sticking-’
Meld-e-fixierung, -drang, -zeit ‘announcing-’
Nag-e-vorrichtung, -fimmel ‘gnawing-’
Les-e-drang, -fimmel, -zeit, -zimmer ‘reading-’
Dös-e-zimmer, -tisch ‘dozing-’

All examples appear to have schwa in their new formations. The obvious exception is *schreib-* which would most probably combine without schwa; *Schreib-einrichtung, Schreib-fimmel* etc. This is also rather expected since all lexicalised instances of *Schreib-* (see Table (2) in III.3 above) do not have schwa epenthesis, and again, the productive formation of new examples may be formed analogous to that. Another exception is *Nies-* (lexicalised e.g. in *Nieswurz* ‘hellebore’, *-pulver* ‘sneezing powder’, *-reiz* ‘urge to sneeze’), which seems to form productively without schwa, thus: *Nies-anfall, Nies-muster*; compare however *Nies(e)fimmel, -zimmer, -drang*. Similar analogous formations may be found with the examples *steig-* ‘climb’ and *saug-* ‘suck’ where, again, the vocabulary suggests schwa-less forms, such as *Saug-napf, Steig-bügel* etc. while the new formations may or may not have schwa: *Saug-vorrichtung* but *Saug-e-drang, Steig-vorrichtung* but *Steig-e-drang*, and particularly *Auf-steig-e-drang*. Again, it can be observed that the schwa is particularly unstable before e.g. *-vorrichtung*, which prefers no schwa and trochaic reversal, while monosyllabic *-drang* seems to prefer the schwa.

(1b) The data from this group contains all verb stems which do **not** end in voiced obstruents and which have a homophonous noun **not** ending in schwa (e.g. *schlaf*_{Vstem} ‘to sleep’ = *Schlaf*_N ‘the sleep’). Based on the fact that these verb stems do not end in the phonological environment which appears to favour schwa insertion, the number of new formations that has an epenthised schwa should be very low. However, this group is of particular interest

because the unaffixed verb stem and the noun are homophonous, and the data therefore displays the very strong morphological and semantic motivation to disambiguate homophonous noun and verb. The only way to guarantee verbal interpretation would be through schwa epenthesis. Therefore, it will be interesting to see which one of these conflicting motivating factors regarding schwa epenthesis will be the dominant one. Recall that in these forms the lexicalised items only have a few exceptions; *Halt-e-stelle* etc.

Overall it appears that irrespective of the presence of the noun - verb ambiguity schwa insertion on the whole tends to be avoided; this may mean that the phonotactic constraint on the environment necessary for schwa insertion outweighs the semantic demands.

Schlaf-fimmel, -drang 'sleeping-'
Kauf-zeit, -fixierung 'buying-'
Koch-drang, -muster 'cooking-'
Rauch-fimmel, -zimmer 'smoking-'
Streik-fixierung, -haus 'striking-'
Spiel-zimmer, -drang 'playing-'
Grill-fimmel, -muster 'grilling-'
Film-drang, ?Film(e)fimmel; all other exx. are perhaps more likely to have nominal semantics cf. *Film-fixierung, Film-stunde, Film-vorführung* 'filming-'
Teer-einrichtung, -fimmel 'tarring-'
Bau-zeit, drang 'building-'
Tanz-fimmel, -fixierung 'dancing-'

However, despite the clear tendency towards a schwa-less form, some examples nevertheless seem to take schwa:

Streit-e-fimmel, -zimmer 'arguing-'
Halt-e-vorrichtung, -fixierung 'stopping-'
Rast-drang, but: ?Rast-e-fimmel 'resting-'
(Ab-/Um-)Wert-e-tabelle 'evaluating-'

It seems of importance that this exceptional behaviour only occurs with examples ending in /t/ (cf. the lexicalised *Halt-e-stelle*). I think that claiming that this insertion here is also based on analogy would be going too far, but the group of voiced obstruents may have to be

expanded. I will return to this observation in the discussion of the rest of the data in III.5 below.

The sub-group which is attached to (1b) contains examples of the kind *Handel*_N ‘trade’ vs. *handel*_{Vstem} ‘to trade’. The only difference to the other data lies in the fact that these examples end in /əl/ or /ər/, and could never have schwa epenthesis after the verb stem. The number of examples found here is quite large, e.g. (in verb form):

wandeln, gabeln, raspeln, jubeln, adeln, wedeln, pendeln, tafeln, löffeln, hageln, schaufeln, kegeln, segeln, klingeln, orgeln, angeln, prügeln, kacheln, bummeln, krümeln, stempeln, popeln, satteln; räubern, zaubern, ködern, schleudern, pudern, rudern, pfeffern, opfern, lagern, tigern, pilgern, prangern, hungern, bechern, feiern, zuckern, tischlern, hammern (hämmern), klammern, donnern, gärtnern, wispern, wassern, eitern, filtern, mauern etc.

The only means which can establish unambiguous semantics for this group is surrounding information: for example in *Kegel-abend* ‘bowling evening’ the first element is the verb stem, while in *Kegel-sammler* ‘skittle collector’ it is the noun. There is no inflection available at all to aid the distinction. The only example where the nominative plural is blocked for semantic reasons if nominal interpretation is sought is *Vögel*²⁵, because here the verb has entirely different semantics attached to it from the noun.

(2b) This group again consists of verb stems which do not end in voiced obstruents and which also have a homophonous noun, but here the noun ends in schwa. Contrasting with the data in (1b), this means that here there is no motivation at all for the insertion of schwa; the epenthesis is discouraged by the phonotactic environment as well as the fact that without schwa, there could be no misinterpretation with the homophonous noun, while with schwa there would be.

Straf-drang, -zimmer ‘punishing-’
Pfeif-fimmel, -stunde ‘whistling-’

²⁵ as noun: ‘birds’, as verb stem: ‘to screw’

Tauf-zimmer, -fixierung 'baptising-'
Zech-haus, -drang 'boozing-'
Schmink-zimmer, -stunde 'making up-'
Spül-fimmel, -stunde 'dish washing-'
Stimm-fimmel, -fixierung 'tuning-'
Pump-stunde, -tisch 'pumping-'
Beicht-zeit, -zimmer 'confessing-'
Wett-fimmel, -muster 'betting-'

Consequently it is not surprising to find that there seems to be no schwa epenthesis at all, neither in the previously discussed lexicalised examples, nor in the new formations. This makes sense inasmuch as an inserted schwa would here (because of the existing homophonous noun) lead to confusions which can be avoided without the epenthesis. Again, some examples may have an epenthesised linking element which is borrowed from the nominal formations, e.g. *Miet-s-haus* '(rented) block of flats' (lexicalised); analogously ?*Miet-(s)-auto, -boot*. The majority of examples, however, have the noun plural available for an unambiguous nominal interpretation, e.g. *Pfeifen-reiniger* 'pipe cleaner', *Tränen-trockner* 'tear dryer', *Pumpen-fabrikant* 'pump producer' (vs. *Pump-vorrichtung* 'pumping device').

(3b) This group again comprises verb stems which do not end in voiced obstruents, and which this time have no homophonous nouns either. Thus, in accordance with all previous findings, and compared to the last group in particular, the expectation is again that no schwa epenthesis should occur; neither the correct phonotactic environment nor any semantic motivation at all is present to warrant the insertion.

Nasch-fimmel, -drang 'nibbling-'
Steh-zimmer, -vorrichtung 'standing-'
Trink-zeit, -fixierung 'drinking-'
Schwimm-muster, -fimmel 'swimming-'
Wohn-einrichtung, -muster 'living-'
Turn-zimmer, -drang '(to do gymnastics)'
Isolier-fixierung, -tisch 'isolating-'
Freß-haus, -fimmel 'scoffing-'
Heiz-fixierung, -vorrichtung 'heating-'

As expected, almost all examples are without schwa epenthesis. One of the exceptions is

Häng-e-... ‘hanging-’ which may again be caused by the analogy to lexicalised forms; cf. *Hänge-matte* ‘hammock’, *-lampe*; *Häng-e-vorrichtung*. Considering other examples ending in the velar nasal, it is less likely however that (cf. *Halt-e-...* above) the phonotactic environment requires expansion to encompass the velar nasal as well (*contra* Žepić (1970) and Fleischer (1974)), cf. *Spring-fimmel*, *-drang*, *Sing-zimmer*, *-fixierung* (and cf. lexicalised *Springseil*, *Singspiel*). See III.3.1 for the /t (ə) d/ - cluster *Reit-drang* vs. *Reit-e-drang*, and the lack of evidence for restrictions of this kind.

(4) This group contains verb stems which are distinct from their homophonous noun only through umlaut: the verb stem is umlauted while the equivalent noun is not (e.g. *Kampf_N* ‘fight’ vs. *kämpf_{Vstem}* ‘to fight’). The umlaut should technically be sufficient to guarantee the unambiguous distinction between noun and verb and thus render schwa insertion unnecessary; the phonotactic environment also does not favour schwa epenthesis (the verb stems do not end in voiced obstruents). An additional difficulty might be that the noun equivalent for *kämpf*-, *lüft*-, *häut*- and *stürz*- forms the nominative plural with the suffix *-e* in combination with umlaut, so that a potentially extended verb stem in e.g. *Kämpf-e_{Vstem}-fimmel* is identical to the Nom. Pl. of the noun in e.g. *Kämpf-e_N-samm_{ler}*.

Kämpf-e-fimmel, ?*Kampf-drang* (not clear whether this is noun or verb, but the distinction is of no importance)

Lüft-e-fimmel, *-fixierung* ‘airing-’

Drück-e-vorrichtung, *-fimmel* ‘pressing-’

Läut-e-zeit, *-muster* ‘ringing-’

Häut-e-drang, *-tisch* ‘skinning-’

Wüt-e-zimmer, *-zeit* ‘raging-’

Töt-e-fimmel, *-vorrichtung* (vs. *Todes-zimmer*) ‘killing-’

Zähl-(e)-fimmel -vorrichtung ‘counting-’

Considering the expectations based on the phonotactic and morphological make-up of the group, the data presents a curious mixture: schwa seems to be inserted after most examples, specifically all ending in /t/ and /k/, but not necessarily after other sounds, e.g. in *Ab-zähl-reim*, *Stürz-vorrichtung*. It is once again /t/ (and /k/) which seem to be able to precede schwa

epenthesis without the schwa being explicitly required (cf. *Halt-e-stelle* etc/ in the lexicalised data).

(5) This group contains verb stems where an alternating schwa may create the noun, e.g. *Regen*_N ‘rain’ vs. *regn(e)*-_{Vstem} ‘to rain’. The issue for these examples is therefore not one of schwa epenthesis, but rather at which position the schwa will surface. One position should indicate verbal semantics, the other noun semantics.

- **Regne*- but: *Regen*-... ‘raining-’
- **Ordne*- but: *Ordnung-s*- ... ‘ordering-’
- **Atme*- but: *Atem*- ... or *(Be-)Atmung-s*- ... ‘breathing-’
- **Zeichne*- but: *Zeichen*- ... ‘drawing-’
- **Trockne*- but: *Trocken*_{Adj}- ... ‘drying-’
- **Rechne*- but: *Rechen*- ... ‘calculating-’
- **Widme*- but: *Widmung-s*- ... ‘dedicating-’
- **Ebne*- but: *Eben*_{Adj}- ... ‘flatten-’

It appears to be completely impossible to form [[Vstem _] [N]] compounds on the basis of these verb stems. It is quite obvious that the noun (or adjective) is preferred in all circumstances which involves the items entering into compounding. This is an interesting observation to make, particularly with a view to examples such as *Zeichen-saal*, *-stunde*, *-mappe*²⁶ etc. and even more so *Rechen-schieber*, *-stunde*, *-aufgabe*; because here is once again an example where the homophonous noun does not quite (*Zeichen* ‘sign’) or even not at all (*Rechen* ‘rake’) share the semantics of the verb - and yet such a formation would be interpreted as being derived from this verb, and the semantics of the homophonous noun is suppressed - to such an extent that it would be quite hard for a native speaker to notice the (coincidental) homophony.

²⁶ Note however that *Zeichen-sprache* is based on the noun *Zeichen* ‘sign’ and not on the verb *zeichnen*. Again, it is the semantics of the compound formation that aid the interpretation.

III.4.1 Visible verb stems

As has been discussed in II.4, there is a range of derivational suffixes in German which specifically serve the purpose of 'visibly' forming verb stems (as opposed to conversion or zero affixation or other 'invisible' processes which affect bases). In section II.5 both noun and adjective formation based on these verb stems was discussed in some detail; here I would merely like to add a range of examples which illustrate how (most of) these verb stems are also input material to compound formation of the type [[Vstem] [N]].

There is the group of examples of the type [[[X]_{Root} *eI*]_{V stem} [N]]:

Kränkzeit, Frömmelstunde, Tänzmuster, Tröpfelvorrichtung, Bröckelfixierung, Funkeltisch.

The type [[[X]_{Root} *er*]_{V stem} [N]]:

Kletterstunde, Räucherzimmer

The type [[[X]_{Root} *ier*]_{V stem} [N]]:

Kollabierstunde, Buchstabiervorrichtung, Absorbierfixierung, Promoviertisch, Produzierungszimmer, Desinfizierhaus, Reagierzeit, Rekonstruiertisch, Halbbierunternehmen, Probiernmuster, Revidierstunde, Skandiervorrichtung, Kommandierungszimmer, Blondierstunde, Grundierfimmel, Applaudierdrang,

[[[X]_{Root} *isier*]_{V stem} [N]]:

Privatisierungdrang, Signalisierungszimmer, Bagatellisierungsvorrichtung, Hypnotisiertisch, Fraternisierungstunde, Dramatisierungsmuster

[[[X]_{Root} *ifizier*]_{V stem} [N]]:

Qualifizierungfimmel, Elektrifizierungdrang, Identifiziertisch, Mystifizierungsvorrichtung

The only group which proves exceptional in that the verb stems are not available for compound formation in the way all others are, is the type [[[X]_{Root} *ig*]_{V stem} [N]](cf. II.4.4 above): **Reinigstunde, *Huldigungsvorrichtung, *Steinigfixierung* etc. Interestingly, the impossibility of the formations can in some instances be slightly improved on by the insertion of schwa, though the end results are still hardly formations which will convince all: *?Beerdigefimmel, ?Begläubigefimmel, ?*Beseitigungszimmer, ?*Benachrichtigungdrang.* I cannot

claim to have an explanation for this. It is striking that the examples are not totally banned under all circumstances, but can still be converted - via schwa - into 'usable' verb stems which are then eligible for compounding. What this may suggest is that perhaps *-ig-* is a less obvious, less productive, and perhaps less successful verb stem forming element, if compared to the much more productive and obvious *-ier-*, for example.

III.5 Summary

I believe it to be important to make the distinction between lexicalised items of vocabulary (where schwa-loss or -retention might be explained on the basis of a diachronic analysis of weakening syllables or re-syllabification) and new formations which prove the productivity of the phenomenon of schwa epenthesis in $[[V_{stem} _] [N]]$ compounds. Even though a number of 'odd' cases in the new formations may be explained by analogy to already existing forms (which are perhaps more readily available in the speaker's mind), quite a large number appear to require phonotactic and morphological / semantic triggers in order to explain the presence or absence of schwa in these forms.

The results of the new formations can be summed up as follows:

- For group (1a), verb stems ending in (potentially) voiced obstruents /b, d, g, z/ with a homophonous (schwa-less) noun, e.g. $bad_{V_{stem}} = Bad_N$: schwa will be inserted after the verb stem in $[[V_{stem} _] [N]]$ if verbal semantics is required. Where the semantics is not completely clear or not important, schwa epenthesis will depend on analogy to existing forms. Productively, however, this means that for this group schwa serves to distinguish verb stem from noun, and is thus important morphological material.
- Group (2a), verb stems ending in (potentially) voiced obstruents, with a homophonous noun ending in schwa; e.g. $geig_{V_{stem}}$ vs. $Geige_N$: Schwa is epenthesised across the board

for verb stems, almost without exception. If **nominal** semantics is required, the Nom. Pl. inflection is inserted; as will be shown in chapter IV, the schwa in [[N] __ [N]] compounds generally blocked unless it is the Nom. Pl. inflection, and even then it can only be inserted if there is no homophonous verb. Again this means that the schwa which is epenthesised in [[Vstem _] [N]] indicates that the first element is the verb stem.

- Group (3a), verb stems which end in (potentially) voiced obstruents, no homophonous noun: Schwa is inserted across the board (despite the fact that it is not required for morphological / semantic reasons), some exceptions are possible based on analogical formations to existing compounds, e.g. *Schreib-*. For this group, schwa epenthesis must therefore be interpreted as being purely phonotactically motivated.
- Group (1b), verb stems which do **not** end in voiced obstruents, with a homophonous noun **not** ending in schwa (e.g. *schlaf*_{Vstem} = *Schlaf*_N): irrespective of the presence of the noun - verb ambiguity schwa insertion on the whole tends to be avoided; this would appear to suggest that the phonotactic constraint on the environment necessary for schwa insertion outweighs the semantic demands; exceptional behaviour only occurs with examples ending in /t/ (cf. the lexicalised *Halt-e-stelle*).
- Group (2b), verb stems which do **not** end in voiced obstruents, with a homophonous noun ending in schwa: no schwa epenthesis at all.
- Group (3b), verb stems which do **not** end in voiced obstruents, with no homophonous noun: almost all examples are without schwa epenthesis.
- Group (4), verb stems which are distinct from their homophonous noun only through umlaut, e.g. *Kampf*_N vs. *kämpf*_{Vstem}: results are inconclusive; schwa seems to be inserted after most examples, specifically all ending in /t/ and /k/, but not necessarily after other sounds.
- Group (5), verb stems where an alternating schwa may create the noun, e.g. *Regen*_N vs. *regn(e)*_{Vstem}: It is impossible to form [[Vstem] [N]] compounds on the basis of these verb stems.

For all examples where the verb stem is homophonous with a noun, nominal semantics can only be guaranteed by inserting nominative plural inflection after the first element of the compound (or, in a few cases, *-s-*). This is less true for examples which have *-e* as the Nom. Pl. inflection, because this is the linking element usually reserved for the insertion in [[Vstem _] [N]] compounds.

Overall, the phonological trigger of voiced obstruents is the most important factor for the insertion of schwa in the environment [[Vstem _] [N]], and the issue of distinguishing verb stem from noun for those examples where a misinterpretation is possible is secondary. If, however, a verbal interpretation is essential and a homophonous noun exists, then schwa can be inserted irrespective of the phonological environment²⁷ (*Filmefimmel*, *Grabefrage*, *Badefimmel*, see IV.3.15 for details). On the other hand, if nominal interpretation is sought and a homophonous verb stem is available, the Nom. Pl. inflection will be inserted (*Grabenfrage*, *Bäderfimmel*).

As will be shown in detail in the following chapter, the insertion of linking elements in [[N] __ [N]] compounds is quite a different, and much more complex affair. For [[Vstem _] [N]], the final segment of the first element in the compound is of crucial importance (outweighing all other morphological / prosodic / semantic factors) for the insertion of schwa. In nominal compounds morphological factors will prove to be of much greater importance than mere phonotactic constraints, and the range of available linking elements which can be found in the juncture position is a whole range of inflectional endings, rather than just /ə/.

It will transpire, however, that there is a strong morphological association of ‘schwa’ in the ‘juncture position’ between two parts of a compound with the category ‘verb stem’ as

²⁷ In the case of *Filmefimmel* schwa may be inserted to mean ‘verb stem’ even irrespective of the fact that *Filme* is also the Nom. Pl.; as will be pointed out in IV.3.15 the Nom. Pl. inflection is blocked if it may cause misinterpretation as a verb stem.

opposed to 'noun'. This may go a long way to explain the fact that on the whole it is very rare to find a noun which ends in schwa retaining this schwa when the noun enters compounding; either the schwa is deleted, or, more frequently, the nominative plural inflection is added. But the blocking of schwa in $[[N] \text{ } __ [N]]$ even goes beyond this: in cases where the Nom. Pl. is *-e* and a homophonous verb exists, the Nom. Pl. inflection will be blocked because it could lead to a misinterpretation. The fact that this is the case requires a blocking constraint to be at work for the insertion of linking elements in $[[N] \text{ } __ [N]]$ compounds for all those examples which have a homophonous verb stem.

If the assumptions from chapter I and II are correct, and the German lexicon has its three strata associated with roots, stems and words respectively, then compounding based on verb stems must be sited on stratum II. Stratum II, however, is also the location for the majority of $[[N] \text{ } __ [N]]$ compounding, including the insertion of regular inflection in the juncture position and the blocking caused by the presence of homophonous verb stems.

Chapter IV: *Semmelknödeln*. Linking elements in the juncture position of German nominal compounds¹.

IV.1 Introduction

At a 1999 Lecture at Edinburgh University with the title “The treatment of phonological sub-regularities and irregularities”, Francis Katamba remarked that “... some irregularities are more irregular than others.” As far as an analysis of linking elements in German nominal compounds is concerned, I have found this to be utterly true. The insertion of a given linking element in the juncture $[[N] _ [N]]$ often appears random at best, and is sometimes so volatile that listing and exception marking seem the only way to deal with the problem. And yet, there are clearly very strong and inviolable rules and/or constraints at work which are predictable. The main aim of this chapter is therefore to separate one from the other and to offer a sensible explanation for the ‘less irregular irregularities’.

This chapter deals with the phenomenon of linking elements in $[[N] [N]]$ compounds (which I shall also refer to as ‘nominal compounds’) in German. There are fundamental differences between the kind of linking elements that can occur in a $[[V \text{ stem}] [Noun]]$ compound, and those under discussion here. As indicated in chapter III, linking elements following verb stems in $[[V \text{ stem}] [Noun]]$ compounds tend to be constrained predominantly by phonotactics, and seem only minimally restricted by semantics (see, however, the issue of blocking in III.4 and IV.3.15). I will show in this chapter that linking elements in $[[N] _ [N]]$ compounds behave completely differently, and follow a host of complex and interacting criteria which determine their insertion. To claim that I can give a series of actual rules which determine the insertion of a certain linking element in a nominal compound would be

¹ This chapter is by far the longest and most complex of the thesis. Due to the complexity of the data, a simple presentation is very difficult, and I can only hope that the detailed discussion of linking elements and inflectional classes is not too tedious a read.

an exaggeration. By the end of this chapter, I will have shown why stating rules for linking elements in [[N] _ [N]] compounds is impossible, and I will state a series of generalisations which come as close to 'rules' as it seems possible to be.

The analysis of the - comparatively rich - German data is placed before the discussion of English compounds (chapter V) to facilitate comparison. The chapter's contents and structure mirror the development of the research I undertook with the linking elements. Following an overview, a definition of compounds in German and some general observations about the phenomenon of linking elements in compounds (IV.1.1 and IV.1.2) and a brief overview of past and present analyses dealing with this issue (IV.1.3), I will present two analyses.

IV.2 offers the first approach, and IV.2.1 - IV.2.7 discuss every linking element independently and in detail, recording its occurrence in the various inflectional classes. The data discussed here is that of lexicalised items of vocabulary, i.e. established compounds that are found in dictionaries (e.g. *Buchladen* 'book shop'), including those which have idiosyncratic meanings (e.g. *Bücherwurm* 'book worm'). IV.2.8 is an initial attempt to unify the generalisations that have arisen out of this analysis.

IV.3 then presents the second analysis which deals with the issue of productivity, i.e. which linking elements are inserted in newly coined, non-lexicalised [[N] _ [N]] formations. Here, the analysis is conducted up-side down: every inflectional class is discussed separately and the occurrence of linking elements in each class is examined. Subsequently it will be shown that some classes can be conflated, which facilitates much more wide-ranging generalisations and predictions. It is only after this analysis of the productive insertion of linking elements in compounds that productive generalisations and predictions can be formulated.

The main objective of this chapter is to prove that linking elements in German nominal compounds are by no means ‘just’ linking elements, that in fact they are all inflections (except -s and -Ø-), and that to argue against this on semantic grounds misses virtually all the regularities which define them. If the arguments are accepted then the inflectional status of linking elements will prove problematic for all approaches which forbid an interaction of inflection and derivation within the lexicon in such a way (cf. Anderson (1988), Chomsky (1991)); see I.4 for a discussion for the theoretical background.

IV.1.1 [[N] [N]] compounding in German

Considering the extended contemplation regarding the definition of ‘compound’ vs. ‘phrase’ in English in V.1, it seems appropriate to at least briefly discuss the topic as it presents itself in German. A compound is the result of a construction of - typically two - morphemes. More specifically, these morphemes are either free morphemes or free morpheme constructions. Less carefully expressed, a compound is a combination of existing words, which forms a unit formally, syntactically and semantically; the combination is inseparable, and the order of the constituents is both semantically and formally relevant. Compounds are usually spelt as one word. Main stress is usually on the first element.

There are, of course, exceptions. There are numerous examples of more than two constituents in a compound; indeed, German has a claim to fame based on examples of the type *Kinderwagenvorhangnäherinnenversammlungsparkplatz* (‘parking lot for the convention of seamstresses of children’s prams’ curtains’). It is important to note, however, that two constituents are the most frequent occurrence. Three are possible, and here [[AB] C] (*Briefkastenleerung* ‘emptying of the post box’) seems to be slightly more usual than [A[BC]] (*Autodiebstahl* ‘car theft’) (Fleischer, 1974:59). Four constituents are not at all

frequent; Fleischer (1974:59) quotes [[AB] [CD]] *Autobahnraststätte* (motorway service station) and *Roggenvollkornbrot* 'rye whole meal bread'. Five constituents or more are possible, as indicated above, but are in reality found only rarely.

There are compounds of the 'cranberry' type, where the first constituent is not a free form, e.g. *Himbeere* 'raspberry', *Brombeere* 'blackberry'. These examples must be interpreted as listed exceptions. Then there are the cases of the separable combinations *hinsetzen* - *er setzt sich hin*; this type is discussed in II.3.3. The order of constituents in German compounds is reversible only in a very small number of examples: the group of copulative compounds, of the type *Kleiderschürze* - *Schürzenkleid* 'dress-apron'. In phrases, on the other hand, the order of constituents can be changed without affecting the overall semantics (provided inflections and prepositions are adjusted accordingly), cf. Fleischer (1974:55): *im Dorf die Straße, des Dorfes Straße, die Straße des Dorfes* 'the street in/of the village'. In the compounds *Dorfstraße* 'village street' und *Straßendorf* 'village of streets' the order of the constituents cannot be changed without changing the meaning entirely. Fleischer (1974:55) further observes that the examples here also show how phrases use inflectional markers as well as prepositions to explicitly express the semantic relationships of the constituents, while in a compound the order of the constituents usually suffices to do this. Part of this claim will be questioned throughout this chapter; it is important to note here that Fleischer (1974) vehemently argues against linking elements being interpreted as inflection.

The internal relationship of the two constituents in a compound can be either that of subordination, e.g. *Großstadt* 'city', *Klangfarbe* 'timbre', or that of co-ordination of both constituents, e.g. *Strumpfhose* 'tights' (all examples Fleischer (1974:54). Overall, a wide range of semantic relationships between two constituents in a compound is possible. Fleischer (1974:57) contrasts *Bratkartoffel* 'fried potato' with *Bratpfanne* 'frying pan' (i.e. 'pan for frying'), *Sonnenschutz* 'sun protection' (i.e. 'protection against the sun') with

Arbeitsschutz ‘work protection’ (i.e. protection against accidents at work’). Sometimes a specific context is required, in order to allow the correct interpretation of an item, e.g. *Gasfuß* - ‘the foot used to operate the gas pedal in a car’. It is also possible to find a phrasal equivalent of a compound, whereby the first element is adjectival, cf. *Wirtschaftshilfe* vs. *wirtschaftliche Hilfe* ‘economic aid’; *Frischmilch* vs. *frische Milch* ‘fresh milk’.

Fleischer (1974:56) observes that the frequency of use of a compound aides the idiomatisation to some extent - a claim which is echoed in the discussion of English compounds in chapter V. It is possible, though by no means certain, that compounding is actually in some instances semantically restricted for this very reason (examples from Fleischer, 1974:59): compare *Silberlöffel* ‘silver spoon’ with **Golduhr* (but: *goldene Uhr* ‘gold watch’), *Rotwein* ‘red wine’ with **Rotrüben* (but: *rote Rüben* ‘beetroot’), *Altstadt* ‘old town’ with **Altfrau* (but: *alte Frau* ‘old woman’).

In German, both gender and wordclass of a compound are determined by the final element in the compound (i.e. the B element in a compound AB): *Groß*_{Adj} *stadt*_N is a noun, and *Klang*^{Masc} *farbe*^{Fem} is feminine. Exceptions are very rare, cf. the type *Princess Royal* in English; Fleischer (1974:54) quotes *Munvoll* ‘mouth full’, *Handvoll* ‘hand full’, both nouns, despite the second element being an adjective.

Compounding also occurs with verbs (cf. chapters II and III), adjectives and adverbs, but most typically with nouns.

“Die ergiebigste Quelle der nominalen Wortbildung ist die Komposition geworden” (Wilmanns, 1896:509)²

² ‘Compounding has become the richest source of nominal word formation.’

Wilmanns' statement could imply that, due to its frequent occurrence, the process of compound formation ought to be straightforward, an easy and productive means to create new word forms which is free from idiosyncratic behaviour and exceptional demands. However, quite the opposite is true:

“Der Kampf und die Verbreitung der verschiedenen Compositionsformen muss noch genauer untersucht werden ... Das Bild, welches die jetzige Sprache bietet, zeigt eine grosse und **ungeregelte** Mannigfaltigkeit.” (Wilmanns, 1896:529, my emphasis)³

Since compounding as a method of forming new words has been in use for so long, a large amount of erosion and fossilisation has occurred over time, so that once transparent forms which could be easily recognised as composite creations are now obscured to the extent that the separate elements are no longer recognisable, cf. English *lord*, *daisy*; German *Fronleichnam*⁴ ‘Corpus Christi’, *Schlendrian*⁵ ‘routine, rut’. Paul (1920:11) observes that many of the discrepancies which can be observed with regard to lexicalised compounds are due to the fact that the simplex word changed, or more specifically: simplified, its inflections over time, while it frequently retained its older inflection within a compound.

³ ‘The struggle and the dissemination of the various forms of compounding still needs to be analysed in more detail ... The picture presented by the language as it is now shows a great and **unregulated** diversity.’ (my emphasis)

⁴ Middle High German: *licham(e)* ‘Leib’ (‘body’), *Fron* Gen. of ‘Frau’ (‘woman’); from Kluge (1989:234).

⁵ from *schlendern* + *Jan* (‘Johann’); Kluge (1989:638).

IV.1.2 Linking elements in [[N] _ [N]]⁶ compounds

K.V.: ...deln.

L.K.: Was deln?

K.V.: Semmelknödeln heißt.

L.K.: Ich hab ja gesagt Semmelknödel.

K.V.: Nein, Semmelknödeln.

L.K.: Nein, man sagt schon von jeher Semmelknödel.

K.V.: Ja, zu e i n e m - aber zu m e h r e r e n Semmelknödel sagt man Semmelknödeln.

[...] das Wichtigste ist das n zwischen Semmel und Knödeln.

L.K.: Ja wie heißt es dann bei den Kartoffelknödeln?

K.V.: Dasselbe n, Kartoffel n knödeln.

L.K.: Und bei den Schinkenknödeln ...

K.V.: Da ist's genauso - da ist das n schon zwischendrin, es gibt keine Knödeln ohne n.

L.K.: Doch, die Leberknödeln.

K.V.: Ja, stimmt - Leberknödeln kann man nicht sagen!

Karl Valentin (1996:104)

Linking elements, also sometimes referred to as 'Fugenelemente', occur in the 'juncture' position of nominal compounds in German. These 'morphemes' (if that is indeed what they are) are inserted in the environment [[N] _ [N]]⁷, and can take the forms *-e-*, *-er-*, *-en*, *-n-*, *-es-*, *-s-* and \emptyset ⁸ e.g.:

(1) (a) *-e-* *Schwein-e-schmalz*⁹, *-braten*, *-stall*, *-schnittel*, *-zucht* etc.

⁶ Throughout the analysis I have been repeatedly tempted to widen the scope to include adjective + noun (or even adjective + adjective) compounds. The issue in these cases is not so much one of an 'insertion of linking elements', but rather the observation of adjective **stems** entering compounding; cf. *Sauerkirsche* vs. *saure Kirsche*, *Wildbach* vs. *wilder Bach*, *Frischmilch* vs. *frische Milch*. Bauer (1978:91) suggests: "In the case of adj. + noun compounds the adjective is not declinable, and usually takes the form of the stem ..." The only observation I wish to make with respect to adj. + n is, that in German the adjective enters compounding completely uninflected, i.e. lacking even the Nom. Sg. ending it would otherwise receive in pre-noun position.

⁷ As has been observed in the previous chapter with respect to [[Vstem] [N]] formation, this bracketing is following existing conventions, but will prove to be incorrect; it should be [[N _] [N]] instead, see e.g. IV.2.4 or IV.3 below.

⁸ I have chosen to treat all linking elements, including *-Ø-*, equally in the first instance. Throughout both analyses it will become clear that this is in fact not appropriate, and that \emptyset and *-s-* have a different status from the other linking elements. This, however, is an observation I was only able to make following various tests. Again cf. chapter III, Footnote 4, *-Ø-* does not signify a zero morpheme (cf. Wurzel, 1984:38).

⁹ In the following analysis, I frequently use hyphens in order to signal word boundaries, isolate inflectional endings or linking elements or indicate deletions. Note that German compounds are almost always written as one word, without hyphens.

‘lard, pork roast, pig sty, pork cutlet, pig breed’

Läus-e-befall, but: *Laus-e-bengel*¹⁰, *laus-e-kalt*_{Adj.}

‘lice attack’, ‘rascal’, ‘very cold’

Mäus-e-plage, -*nest*, -*bussard*; but: *Maus-e-falle*, -*loch*¹¹, -*tot*_{Adj.}

‘plague of mice’, ‘nest of mice’, ‘buzzard’, ‘mousetrap’, ‘mouse hole’, ‘stone dead’

- (b) -*er*- *Kind-er-garten*, -*wagen*, -*spiel*, -*arzt*, -*buch*, -*feindlich*_{Adj.}, -*leicht*_{Adj.} etc.

‘kindergarten, pram, children’s game, paediatrician, children’s book’, ‘anti-children’, ‘dead easy’

Büch-er-regal, -*schränk*, -*kunde*, -*laden*, -*wurm* etc.

‘book shelf, book case, knowledge of books, book shop, book worm’

Ei-er-schale, *Ei-er-kuchen* ‘egg shell, pancake’

- (c) -*en*- *Frau-en-frage*, -*held*, -*wahlrecht*, -*arzt*

‘women’s issue, lady-killer, women’s vote, gynaecologist’

Dorn-en-hecke, -*krone* ‘hedge of thorns, crown of thorns’

- (d) -*n*- *Schwester-n-liebe* (Duden (1980) cites both, “love between sisters” as opposed to

Schwester-liebe “love of a sister” (?)), -*wohnheim*, -*tracht*, -*liebe*

‘nurses’ home, nurses’ outfit, sisterly love’

Seide-n-kleid ‘silk dress’

Freude-n-tränen ‘tears of joy’

Alte-n-hilfe, -*heim*, -*pflege* ‘old people’s aid, - home, -nursing’

- (e) -*es*- *Tag-es-zeit*, -*zeitung*, -*reise* ‘time of day, daily paper, daily travel’

Meer-es-früchte, -*biologie*, -*strömung* ‘seafood, maritime biology, ocean current’

Kind-es-alter, -*aussetzung*, (von) *Kind-es-beinen* (an), -*mißhandlung*

‘childhood, abandoning of a child, from childhood, child abuse’

- (f) -*s*- *Recht-s-anspruch*, -*system*, -*berater* ‘legal right, judicial system, legal adviser’

Liebe-s-brief, -*erklärung*, -*gedicht* ‘love letter, declaration of love, love poem’

Beruf-s-ethik, -*leben*, -*wechsel* ‘professional ethics, - life, change of job’

Arbeit-s-lohn, -*amt*, -*tag*, -*geber*, -*loser*

‘wages, employment office, working day, employer, unemployed person’

Gleichheit-s-prinzip ‘principle of equality’

Vergnügung-s-reise, -*park* ‘pleasure trip, amusement park’

¹⁰ *Lausbengel* in Austrian German, cf. Footnote 12 below.

¹¹ Duden (1980) also lists *Mäus-e-falle* and *Mäus-e-loch* with umlaut, but with the remark that these forms are “much rarer” than the non-umlauted forms.

Schwein-s-galopp, -ohr, -haxe, -leder; (also: *-braten, -schnitzel, -borste* [in Austrian, Swiss and southern German; these examples would have *-e-* in standard German¹²]) ‘double quick’, ‘pig’s ear, knuckle of pork, pig leather’; ‘roast pork, pork cutlet, pig’s bristle’

Kind-s-kopf ‘person who behaves childishly’

(g) -Ø- *Kind-bett, -taufe* ‘childbed, child christening’

Schwein-igel ‘dirty pig’

Buch-handlung, -druckerei, -besprechung, -führung etc.

‘book shop, book printers, book critique, accounts’

Schwester-schiff, -firma ‘sister ship, affiliated company’

Ei-gelb, Ei-schnee ‘egg yolk, beaten egg white’

Mütter-heim, Mutter-tag, -mal ‘maternity home, mother’s day, birth mark’

In the previous chapter, I discussed linking elements in [[Vstem _] [N]] formations. The reason why I treat these linking morphemes separately is that here, a variety of morphemes can be found, some of which resemble plural and genitive singular inflections, while in the [[Vstem _] [N]] compounds only schwa can occur. Also, the main issue concerning the linking elements in nominal compounds is not so much whether or not they establish the word category of the first constituent in the compound (which appeared to be their main function in [[Vstem _] [N]] compounds), but rather whether or not the linking element, which in many cases **looks** like e.g. plural inflection, can actually be interpreted as such.

One of the reasons why these linking elements have caused a great deal of confusion is that their occurrence (or lack of it) is generally not predictable¹³, to the extent that not only may a word vary as to whether or not it has the link in combination with another word, but also which of the above mentioned forms this linking element might take (see e.g. *Kind-* above which combines in (b), (e), (f) and (g)¹⁴). Fleischer (1974:121) states: “Ein dem Stamm der

¹² Similarly to the schwa after verb-stems, the linking elements show some extent of speaker-specific variation (as would be expected; the schwa which is so unpopular in southern, Swiss and Austrian German is often left out or substituted by /s/).

¹³ cf. Wiese (1996a:143).

¹⁴ This particular phenomenon is, however, quite rare, and restricted to a few items, cf. also *Mann-s/-es/-er* (with umlaut)/-Ø; *Mond-en/- Ø*; etc.

ersten Konstituente nicht ohne weiteres zuzurechnendes zusätzliches Fugenelement kann auftreten oder fehlen”¹⁵ - a quote which characterises matters very well. However, for every compound it is quite fixed which linking element is the ‘correct’ one. Native speakers’ intuition is very strong about which forms are acceptable and which are not (whether or not the origins of a particular form are transparent or not); and furthermore, this claim applies to the standard, lexicalised vocabulary as well as to new, made-up formations. The high degree of apparent irregularities in conjunction with very accurate predictability by native speakers is what makes linking elements in nominal compounds so interesting to analyse. It is this predictability which suggests that there should be generalisations to be made, which capture that linking elements are not merely an array of irregularities which are memorised. It is the predictability of linking elements in newly coined formations in particular, however, which demands the existence of such generalisations and rules, because it proves that mechanisms are being applied **productively**. With respect to both these criteria, the insertion of linking elements in nominal compounds is similar to the schwa-insertion in [[Vstem _] [N]] compounds; cf. chapter III.

In this chapter, I will attempt to analyse linking elements in nominal compounds in German in detail. German morphology and phonology in general have received a great deal of attention, and the distribution of linking elements in nominal compounds is frequently quoted as one of the great mysteries of German word-formation (Wilmanns (1896), Bloomfield (1933), Wurzel (1970), Fleischer (1974), Wiese (1996a)). However, many approaches appear to be content with the observation that there are some minor generalisations to be made, but that the bulk of the data is too inconsistent to allow any degree of accuracy in predicting which linking element occurs (Anderson (1992:296), ten Hacken (1994:149), Wiese (1996a: 143ff). Bauer (1983:53) tentatively suggests that every A element in a compound AB should be listed in the lexicon with **one** (and only one) linking

¹⁵ ‘An additional linking element which cannot easily be ascribed to the stem of the first constituent can occur or be absent.’

element. This suggestion however is made explicitly only for Danish, not German, where nothing is said on the matter of distribution. Most authors are in fact content to observe the semantic emptiness of the linking elements without addressing the issue of distribution and regularity at all: "The core example of a meaningless element appearing obligatorily in certain contexts is the linking element in German compounds" (ten Hacken (1994:258), but see also Bauer (1988:23f)). The voices which suggest that there is more to linking elements than 'glue function' and phonetic lubricant are few and far between: Wilmanns (1896), Žepić (1970), Booij (1977) and Duden (1984).

The insertion of a linking element in a compound depends on a variety of characteristics of its environment:

(1) As already pointed out, what kind of linking element is inserted depends without question on the word category of the first element in the compound. If this is a verb, then only /ə/ can get inserted; if it is a noun, /ə/, /ər/, /(ə)n/ or /(ə)s/ may be used. This *a priori* observation is used as the basis for the analysis.

(2) In nouns, the kind of linking element inserted will furthermore depend on the inflectional class of the first element, i.e. the gender (e.g. certain feminine nouns tend towards -s- link), and what kind of plural affix the item usually takes (e.g. if the regular nominative plural is in -s, then the linking element inserted will **never** be -s-; but if the regular plural is in -er, the linking element is quite likely to be -er- as well). This criterion, i.e. the assumption that the first noun's membership of inflectional class is crucial, forms the basis of my analyses. It is not as such a novel idea, and has sometimes been either alluded to (cf. Wiese (1996a:143ff), or taken on as the conceptual starting point for the analysis (cf. Žepić (1970)). An examination of data has never, to my knowledge, been done in as much detail as here, and with as many different angles on the analysis.

(3) The linking element does not depend on the length of the first item (i.e. the number of syllables); cf. Wiese's (1996a) observation that all linking elements that add a schwa

syllable may be prosodically motivated (p.143): “they create preferred prosodic structures, namely branching feet.” This particular approach offers as little insight into the problem as it did in the case of [[Vstem _] [N]] compounds, where prosody appeared to be of little relevance. However, cf. IV.3.13 and IV.3.14 on how a morphologically complex N₁ affects the choice of linking element.

(4) In terms of phonotactics, the last segment (or: the last syllable) of the first noun may seem to influence not only whether or not the item attracts a linking element, but also which one. It would appear that if N₁ ends in -s, a vowel or certain schwa syllables (that is: -*el* vs. -*en*, -*er*), the choice of linking element is affected. Again, drawing the parallel to the [[Vstem _] [N]] compounds, this criterion alone is not sufficient. I will demonstrate that the primary choice of which linking elements are ‘eligible’ is made by other means, and phonotactics is only responsible for fine-tuning. Thus, in connection with criterion (2) above, the question of whether the first noun ends in a consonant or a vowel is of interest when establishing **which of the forms** may attach. For some examples this is quite crucial, because having a linking element seems to become obligatory e.g. in some classes after -/ə/, so that Ø (‘no linking element’) is not an option: see examples from MASC. VI. (*Erbe, Kollege, Hase ...*) and FEM. IV. (*Familie, Asche, Kirche ...*)¹⁶. The initial sound of N₂ however plays no role in determining the choice of linking element. Arguments connected to this issue will be pursued in the analysis of the individual classes in IV.3.1 - IV.3.13.

(5) A criterion which certainly plays an important role for the choice of linking element is the morphological structure of the first element, i.e. if N₁ has a derivational suffix or is already a compound. Noun-forming suffixes like e.g. -*heit*, -*keit*, -*ung*, -*ität* etc. for example invariably attract the linking element -s-. For more detail on complex first elements, see IV.3.13 and IV.3.14 below.

(6) One condition which has caused the most controversy concerning linking elements is semantics. At issue is, for example, whether or not the plural meaning which may be indicated by the plural inflection on the first element of the compound can be shown to be

¹⁶ Alternatively the /ə/ may be deleted, cf. *Schultasche* ‘school bag’, *Kirchhof* ‘church yard’ etc.

sufficiently relevant to account for the large number of ‘regular’ plural affixes that turn up in the juncture position. To simply reject the notion that the presence or absence of a plural morpheme may have an influence on, or be determined by, the overall meaning (argued e.g. by Bloomfield (1933:231) citing *Sonnenschein* ‘sunshine’; also by Wiese (1996a:144) on the basis of cases like *Kind-er-wagen* - a pram for one child; and Žepić (1970:25)), does not seem to account for all the facts. The same (morphological) considerations apply for the genitive singular potential of some forms.

(7) There would appear to be further morphological conditioning with respect to the linking element; some lexical items never occur with any link (even though they may qualify for some), e.g. *Tisch-decke* ‘table cloth’; some items never occur without a linking element, e.g. *Straße-n-bahn* ‘tram’; and some have variation across the possible linking elements that are available for them: *Kalb-fleisch* ‘veal’, *Kalb-s-leber* ‘veal liver’, *Kälb-er-magen* ‘veal stomach’.¹⁷

(8) Finally, there is the issue of at what point exactly the insertion occurs; the discussion of [[Vstem _] [N]] in the previous chapter offered strong evidence in favour of an attachment of /ə/ onto the verb stem (as opposed to an insertion of schwa in the ‘juncture position’). If linking elements can be shown to have a similarly strong link to the first element in the compound, then the convention of locating the insertion point between the two compound parts ([[N] __ [N]]) will be replaced with one whereby the insertion is located immediately after the first noun: [[N __] [N]].

IV.1.3 Literature review

I will first examine, very briefly, the forms and potential origins of the linking elements, and briefly examine proposed solutions to the problem in general¹⁸. It has been suggested

¹⁷ Thomas-Flinders (1983:125) contrasts *Geist-es-größe* ‘size of intellect’ vs. *Geist-er-bahn* ‘ghost train’. In my opinion, these are two different lexical items; the *Geist* in the first example being ‘mind, intellect’ and in the second ‘ghost’. This may well be connected to the fact that these compounds are, to a certain extent, lexicalised; even though the first example could technically refer to the size of a ghost as well, this is unlikely because the item is fixed with a specific meaning already.

¹⁸ This section is not an exhaustive literature review. I will return to more detailed points regarding proposed analyses in IV.2 below in the discussion of the separate linking elements. This is due to the

frequently (e.g. Wilmanns (1896:525), Žepić (1970:24), Fleischer (1974:122), Wurzel (1970:95), Wiese (1996a:144)) that the linking elements are similar to¹⁹ or identical with inflectional endings, namely the nominative plural (*die Tag-e, Hund-e, Kind-er, Bild-er, Mensch-en, Frau-en, Muskel-n, Stachel-n, Park-s, Stau-s*) and the genitive singular (*des Tag-es, Kind-es, Stachel-s, Park-s*). Wiese (1996a) furthermore adds the dative plural (*den Instrument-en, Stern-en* (Nom. Pl.: *Instrument-e, Stern-e*) to the range from which linking elements may be selected; I will comment on this in IV.2.2 below. Overall, the fact that modern German linking elements form a proper subset of inflectional affixes may well diachronically point towards the original motivations for having linking elements in the first place, see e.g. Wilmanns (1896:517ff) and Fleischer (1974:122ff). Only *-s-* (cf. Wiese (1996a:144f)), however, will prove to be somewhat exceptional.

In the second part of *Deutsche Grammatik*, Wilmanns (1896:509ff) provides an overview of the diachronic development of the linking elements in nominal compounds. His account notes the current *status quo* of linking elements and comments on such cases where the historical background is clear and indisputable; it does not, however, offer any speculations as to why some other, less transparent developments may have occurred. Wilmanns (1896:529) states: “Im allgemeinen aber haben geläufige Composita eine durch das Herkommen bestimmte Form gewonnen, und mögen auch die Gründe, warum gerade diese Form ausgeprägt und zur Geltung gekommen ist, verborgen sein, so hat man die Formen doch anzuerkennen.”²⁰ He singles out the genitive singular inflection particularly as having been retained on the first element of a compound, and being easily recognisable as such, e.g. *König-s-sohn* (i.e. the king’s son), *Gott-es-haus*, *sieg-es-gewiß*, *lesen-s-wert*²¹ etc. Wilmanns

nature of the problem: the phenomenon is not homogeneous and neither, therefore, are the proposed solutions.

¹⁹ i.e. resembling the inflectional ending in appearance only, not however in function or meaning.

²⁰ ‘In general, however, familiar compounds have acquired a certain form through their origin, and even if the reasons why it is this form specifically which has survived and is dominant are unknown, the forms themselves have to be accepted.’

²¹ The linking element *-s-* is of particular interest in adjectives, where it is not - or no longer - possible to use these adjectives with a noun in the genitive; cf. *könig-s-treu* (: **des Königs treu* cf. OHG Gen.

also mentions the - as far as I am aware - only two examples where the OHG genitive inflection is still retained in modern German (albeit now lexicalised and no longer recognisable as such): *Nachtigall* ‘nightingale’, *Bräutigam* ‘husband’ (cf. OHG *nahtegale*, *bruitegome*²²). However, there is no explanation (apart from an analogical spreading of the linking elements used in these very frequent genitive compounds, as is suggested e.g. in Paul, 1920:11) why the linking element -s- should have developed in such cases where it is obviously no longer fulfilling the syntactic functions of the genitive singular, e.g. *Jägersmann* ‘hunter’, *Anwaltskanzlei* ‘lawyer’s practice’²³, *Bischöfsversammlung* ‘council of bishops’, *Freundeskreis* ‘circle of friends’, *Zwillingspaar* ‘pair of twins’ (ex. Wilmanns, p.519; cf. also Wurzel (1970:95)). Further, see the discussion of -s- in IV.2.1.

In his approach, Wilmanns takes the relationship between the two (or more) items in the compound as a starting position for his inquiry, and some of the initial issues he deals with are the various cases the first item can occur in. Interestingly, this not only leads to the above mentioned discussion of the genitive -s- links, but also to an analysis of what now appear as accusative composita, even though these were originally impossible: “Accusativ-Composita können nicht wie die Genitiv-Composita durch die Verschmelzung des abhängigen Casus mit dem regierenden Substantiv entstehen, denn Substantive regieren keinen Accusativ.”²⁴ (Wilmanns, 1896:520f). Formally identical²⁵ to ‘proper’ compounds (see below), i.e. without linking element, these accusative compounds may well have been based on transitive verbs originally, e.g. *Wein-trinker* ‘wine drinker’ - *Wein trinken* ‘to drink wine’; *Dank-sagung*, *Haus-haltung*, *Teil-nahme* etc.; but cf. *Buch-binder* ‘book binder’-

Sg. *kuninges* now: Dat.; *dem König treu sein* ‘be faithful to the king’), *mannstoll*, *staatsklug*, *geisteskrank* etc. (from Wilmanns, p.520)

²² Wilmanns (1896:519) further suggests that the development from /e/ to /i/ might be attributed to the following <g> -- /j/ in OHG (Braune (1955⁸:112).

²³ N₁ here could be singular; the point is, though, that it could also be plural - and the Gen. Pl. of *Anwalt* is *Anwälte*.

²⁴ ‘Accusative compounds cannot be formed like Genitive compounds through the fusion of the depending case with the governing noun, because nouns do not govern accusatives.’

²⁵ Because the Acc. Sg. and Nom. Sg. were frequently identical, a distinction on the basis of inflectional affixes alone would be impossible.

Bücher binden ‘to bind books’; *Nuß-knacker*, *Traum-deuter* etc. requiring a plural object. Wilmanns also mentions examples where the first element could (semantically/syntactically) be either, accusative or genitive: *Städt-e-gründer* ‘city founder’, *Tote-n-gräber* ‘grave digger’, *Kind-er-erziehung* ‘children’s education’ etc. (cf. *Befehl-s-haber* ‘commander’, *Frieden-s-brecher* ‘peace breaker’). In my own analysis below I do not refer to accusative compounds at all, because the accusative ending is formally non-distinct from the nominative ending in the plural as well as the singular²⁶, and I would not wish to argue for the presence of an accusative case solely on semantic grounds. Formally, for example, a -Ø-linking element in all classes except MASC. VI. could signify Nom. Sg., Dat. Sg. or Acc. Sg; in some other classes it could also be Gen. Sg. and in yet another set Nom. or Acc. Pl. At this point, it is already becoming clear just how far removed we are from Humboldt’s Universal of ‘One form, one meaning’ (cf. Carstairs-McCarthy, 1987:13).

Returning very briefly to Wiese’s (1996a) claim that some of the linking elements might be dative plurals (see also IV.2.2), it remains to be added that there are a few examples which have the semantics normally associated with a dative relationship between the first and the second item of the compound. However, it is not possible to judge this syntactic relation from distinct dative endings (as they are formally not necessarily identifiable as such), cf. *milch-ähnlich*, *gott-ergeben*, *riese-n-gleich*, *-groß* (cf also *könig-s-treu*), whereby the first two examples are Nom. Sg. and the second two might be Nom. or Dat. Pl. There do not seem to be any examples with Dat. Sg. which is visible in the inflection.

One of the main difficulties with the analyses of both Wilmanns (1896) and Fleischer (1974) is that both attempt to capture synchronic generalisations based on what are mainly phonotactic observations. Both authors present lists of the kind ‘after letter x, one finds linking element y’. References to the inflectional paradigms are rare, and often only used to show the inadequacies of such a comparison. Wilmanns (1896:526) observes that many

²⁶ Except MASC. VI., see below.

feminine nouns that have *-s-* as a linking element end in *-t/* and very few in *-ə/*; and that feminines ending in *-ə/* most frequently have *-n-* as a linking element. While this is true, it also seems to be merely accidental; the main regularities depend on N_1 's membership of inflectional class. As a vague rule (or rather: a guideline) Fleischer (1974:125) suggests that *-es-* is hardly ever found after voiceless stops */p, t, k/* and */f/*. This is partly wrong, since it does occur after some examples: *geist-es-krank*, *Gott-es-haus*, etc. and otherwise accidental (see IV.2.1). Any kind of phonotactic motivation for or against the insertion of linking *-s-* can be virtually ruled out²⁷, cf. *Blut-s-tropfen* on one hand, and *Macht-denken* on the other (examples from Fleischer (1974:126)). However, other regularities that Fleischer mentions seem to hold, e.g. 'No *-s-* after monosyllabic feminines or polysyllabic feminines ending in *-e*'; cf. *Haut-krankheit*, *Nacht-schattengewächs*, *Latte-n-rost*, *Banane-n-eis* etc., but cf. *Liebe-s-brief*. But while these generalisations seem true, they do not capture other mechanisms that govern the insertion of *-s-*: while it is true to say that **Banan-es-* is ill-formed, the correct form is *Bananen-*, not because of the number of syllables in this item, but because the presence of *-(e)n-* in the paradigm overrides the insertion of *-s-*, see IV.2.2 below.

Wilmanns, following Jacob Grimm, distinguishes initially between two different types of compounding, 'eigentliche Zusammensetzung' ('true, real compounding') and 'uneigentliche Zusammensetzung' ('untrue/improper compounding') (1986:513ff)²⁸. In true compounding, the oldest form of combining words, it has to be possible to distinguish the stem forms unambiguously from each other, even though there are no requirements set out for these stems to be free forms, nor are they necessarily productive. What is most characteristic of this form of compounding is that it never had any linking elements of any kind in the juncture position. 'Untrue' compounding, on the other hand, crucially employs these linking elements (originally: inflectional markers on the first element of the

²⁷ Except, of course, after */s, f/*, where e.g. *-es-* is used instead.

²⁸ Bauer (1978:95) also mentions the issue of 'eigentlich' ('proper') vs. 'uneigentlich' ('improper') in compounding – and concludes that this distinction is no longer helpful to account for linking elements.

compound), to mark the syntactic relationship between the combining items. Wilmanns (1896:524f) observes that the inflectional markers which signal case and number in the ‘untrue’ compounds did not remain in that function alone, but spread out; not only to cases where the actual syntactic relationship between the two items is no longer faithfully represented (e.g. *Jägersmann*), but also to words which lack these affixes in their inflectional paradigm altogether, i.e. where the occurrence of the linking element is not morphologically motivated, see also Wurzel (1970:96), (on e.g. the -s- linking element in feminine nouns): “die Flexionen wurden selbst zu Mitteln der Composition.”²⁹

Fleischer (1974) assumes a historical reasoning (following Wilmanns), differentiating between ‘true’ or ‘proper’ compounding which is free of linking elements, and ‘improper’ compounding with linking elements, which depends on the syntactic relation of the first element to the second. (Examples: *Gottesbote* ‘God’s messenger’, *Tagedieb* ‘idler’, *Tageslicht* ‘daylight’, cf. Fleischer (1974:122).) However, based on the multitude of semantic contradictions, Fleischer vehemently argues against the idea that linking elements could still be inflections: “Das Fugenelement hat also nicht mehr die Funktion eines Flexionszeichens. Es ist [...] überhaupt kein Zeichen mehr, sondern seine Setzung oder Unterlassung eine Frage des Sprachgebrauchs, der Konvention, der Üblichkeit - ohne funktionelle Motivation.”³⁰ (Fleischer, 1974:126).

However, as both Wilmanns and Fleischer admit, it is no longer possible to make this distinction between ‘proper’ and ‘improper’ compounding synchronically, particularly since the insertion of linking elements is so productive and has resulted in such a vast number of analogous formations where it is difficult to argue for a direct link with inflectional affixes. This can be shown primarily in the missing semantic connection between the meaning

²⁹ ‘The inflections themselves became the means of compounding.’

³⁰ ‘The linking element thus has not longer the function of an inflection. It is [...] no longer a sign, but rather its insertion or lack of it is a question of usage, convention, standard - without functional motivation.’

‘plural’ or ‘genitive’ in the inflection on the first element, and its overall meaning: *Schweinebraten* (a roast not usually consisting of more than one pig), *Freundeskreis* (circle of more than one friend) etc. Whether this is sufficient motivation to discount this relatively strong link between the regular plural affix and the identical linking element remains to be seen. More obviously analogous are formations where the linking element is not part of the inflectional paradigm of the item, and thus seems even more ‘random’, e.g. *Liebesbrief* vs. *der Liebe* (Gen. Sg.) etc. *Grammatik Duden* (Duden, 1995⁵: 401) claims that compounding between two nouns (example: *Lebensäußerung*) has as its first element a ‘variant of the form’ *Leben*, which is *Lebens*, whereby *-s-* is seen to function as a ‘Fugenelement’ **without any meaning**. There are plenty of examples of a very productive nature where e.g. the *-s-* link has spread analogously to attach to female nouns (which do not have *-(e)s-* in their inflectional paradigm).

There are also sufficiently many examples where the distinction between singular and plural is semantically evident, and is signalled in the plural inflection which attaches to the first item in the compound, e.g. *Häus-er-block* ‘block of houses’, *-front* ‘front of houses’, *meer* ‘sea of houses’ as opposed to *Haus-kauf* ‘home purchase’, *-boot* ‘houseboat’, *-meister* ‘caretaker’ etc. I will attempt to treat these cases as ‘regular’ in the first instance, but also look at examples where some kind of ‘generic’ interpretation seems to be more appropriate - and independent of plural inflection; cf. *Apfelkuchen* ‘apple cake’, *Krebssammler* ‘crab collector’ etc.³¹. A similar argumentation can be found in Booij (1996:10): “For instance, in the compound *bookseller* the left constituent *book* is not to be interpreted as a singular noun. Instead, it has a categorial interpretation, and refers to the category of books.” In this thesis, the term ‘generic’ is used in the sense of ‘categorial’ as described in Booij (1996). Fleischer (1974:59) also briefly discusses this: ‘the car’ can mean generally ‘the category of cars’ as

³¹ I do think that argumentations of this kind are largely random; it could just as convincingly be argued that a *Buch-handlung* is where ‘you can buy a book’. I do not think that a ‘sentence type analysis’ in the style of Marchand (1969b) or Tietze (1974) offers any solutions for the singular vs. plural issues. That is not to say that such an analysis might not be helpful when considering questions concerning case relationships between the components of a compound.

well as ‘the specific car standing over there’; in a compound AB it is possible that the A element may have its individual interpretation reduced and the general classification may then come to the foreground, e.g. a *Seidenkleid* ‘silk dress’ is not a dress made from a specific piece of silk, and a *Briefumschlag* ‘envelope’ is not an envelope for a specific letter.

If, however, the general thesis that quite a number of the *-er-* and *-en-* linking elements can be interpreted as plural inflection is to be upheld, one of the consequences would be to have a considerable amount of inflectional operations in the lexicon (cf. Wiese, 1996a:146), and, more specifically: inside derivation (e.g. *Kind-er-chen*³², *Student-en-schaft* etc., cf. chapter I) and compounding (*Mütter-genesungswerk*, *Hase-n-braten* etc.). It remains to be seen whether or not lexical stratification can offer some solutions as to at what point in the derivation these inflections are attached. The theoretic framework of this thesis implies that since compounding (at least in its productive aspect) deals with stems and words, it should be situated on strata II and III, and not on the exceptional stratum I where listing and root derivations occur. On stratum I, such compounds could be listed which are obscured and which have linking elements that are no longer productively available for the example in question.

Before I turn to my own proposals concerning linking elements, I will briefly discuss three very different analyses that have been undertaken in the past: Wurzel (1970), Žepić (1970) and Wiese (1996a).

³² N.b. The **overall** semantics of *Kinderchen* is plural, whereas the overall semantics of *Studentenschaft* is singular. This is connected with the nature of the suffixes. *-chen* (and also *-lein*) are diminutives, which tend towards plural interpretation; noun + *-chen/-lein* can be either Sg. or Pl. (*Ei-lein*, *Kind-chen*, *Häus-lein* etc.), but noun_{plural} + *-chen/-lein* can only ever be plural. noun-*schaft* on the other hand is always overall singular, but only ever attaches after noun_{plural} (with the semantics of ‘a group of ...’), but not in the kind *Landschaft*, *Freundschaft*, which are neutral with respect to the number of their base (I would argue this even in cases like *Kindchen* which can be read as Sg. or Pl.).

Wurzel (1970:95) states: "Wir fassen generell die "Fugenelemente" als Stammbildungselemente auf, ohne dabei ihre historische Herkunft zu berücksichtigen"³³. This quote actually sums up everything that is wrong with Wurzel's analysis from today's viewpoint, and from the position of LP in particular. Primarily the problem is the definition of the term 'stem' (cf. I.3, where it is argued that there is no such thing as a visible 'noun stem' in present day German), which for Wurzel means the part of a word which is larger than the root, and to which inflection attaches (1970:26): "... ein Stammbildungselement ..., das den Substantivstamm bildet, indem es an das Wurzelmorphem tritt, wenn dieses nicht im Nominativ Singular steht."³⁴ As was discussed in I.3 the position I have chosen to adopt here is that many of the affixes which Wurzel terms 'stem forming elements' I consider to be part of the root, e.g. the *-e* in *Rose* or the *-en* in *Brunnen*, but not e.g. the *-en* in *Bären* (this is inflection).

It is also noteworthy that the idea of 'stem-compounding' is by no means new: Wilmanns (1896:524) points out that he does not, in fact, regard *N₁* as standing in the nominative singular, but rather as the stem of the noun: "... sie sind nicht mit dem Singular zusammengesetzt, sondern nach alter Weise mit dem Stamm, an dem weder Casus noch Numerus zum Ausdruck kommt."³⁵

Thus, Wurzel (1970:26) states that *-(e)n-* is neither case- nor number-affix, but a 'stem'-forming element which forms the noun stem by attaching to the root morpheme, if this is **not the nominative singular** (e.g. *Bär* → *Bären*, *Löwe* → *Löwen*). He argues that these stem-forming elements are a requirement if the item is to enter compounding (*Bärenfalle*, *Löwenfell*) and for the attachment of genitive inflection (*des Glauben*, *des Herzens*, *des*

³³ 'We interpret the "linking elements" in general as stem-forming elements, without taking their historic background into account.'

³⁴ '... a stem-forming element ..., which forms the noun stem by attaching to the root morpheme, unless this is in the nominative singular.'

³⁵ '... they are not combined with the singular, but according to old tradition with the stem, which shows neither case nor number.'

Namens). Stem-forming elements are not required for the attachment of derivational suffixes, cf. *Bärchen*, *Löwin*. However, there are examples where, according to Wurzel, stem-formation also occurs in the nominative singular (contra the original claim), *Brunnen* (cf. *Brünnlein*), *Haken*, *Husten*, *Zapfen* etc.; and there are examples where the /n/ is already part of the root (*Segen*, *du segnest*).

So, while stem-forming elements are not a pre-requisite for the attachment of derivational affixes, they are required prior to compounding. Initially, Wurzel makes the case only for word-final *-e* (*Löwe*, *Rose*, *Auge*), arguing that to interpret schwa in this position as an inflectional affix would counter the notion that German nouns never have inflection in the nominative singular, and further stating that all normal native German morphemes are monosyllabic (see also Golston and Wiese (1998)) (Wurzel (1970:27). The notion of stem-formation is also invoked for *-n-* in *Bärenhunger* ‘bear-like hunger’ etc. as well as *-r-* in *Hühnerkeule* ‘chicken leg’, based on the fact that the semantics of ‘plural’ is inappropriate for these examples.

As a result, Wurzel’s generative machine has an impressive array of rules to deal with, for example to achieve the insertion of regular inflectional affixes. To arrive at the correct output for Dat. Pl., Wurzel (1970:28) employs stem-formation, inflection, e-epenthesis, e-deletion and geminate fusion:

DATIV	hund	spigl	kind	r̄ōz
Stem formation	hund	spigl	kind + r	r̄ōz + n
inflection	hund + n	spigl + n	kind + r + n	r̄ōz + n + n
e - epenthesis	hund + en	spigel + en	kind + er + en	r̄ōz + en + en
e - deletion	hund + en	spigel + n	kind + er + n	r̄ōz + en + n
geminate fusion	hund + en	spigel + n	kind + er + n	r̄ōz + en

While conducting an analysis of German inflection vs. derivation, Wurzel suggests that to interpret linking elements as inflection would be inappropriate. This observation is based largely on semantic arguments (see above), but in some instances it also refers to morphological and syntactic criteria: *-s-* cannot be interpreted as the genitive singular inflection any more (even though that is its origin), because it is neither syntactically (*Jägersmann, Lieblingsgetränk*), nor morphologically (*Arbeitszeit, Geburtstag*) a genitive (Wurzel, 1970:95). Therefore, all linking elements are to be interpreted as ‘stem-forming’ elements. Wurzel (1970:96f) draws a very superficial parallel between linking elements and inflectional affixes, which means that he misses a number of generalisations that can be made when the separate categories are compared. One problem that Wurzel encounters while formulating rules pertaining to the insertion of ‘stem-forming elements’ is that, as with the insertion of linking elements, there is a very large number of exceptions. The other problem with this analysis is that the insertion of the ‘stem-forming’ elements is externally stipulated, based on characteristics of declension classes (e.g. [+strong], [-strong], [after suffix] (for *-s-*), etc.). Wurzel notes the drawbacks of these rules and gives a large number of counterexamples; in the end his proposal amounts to an admission that the original linking elements (i.e. those based on case relations between the compound parts) require listing, and that all new elements are inserted based on analogies to these already existing forms (1970:96).

Wurzel (1970:99) also introduces the additional notion of ‘countability’ - again with doubtful success, because examples like *Pferdestall* ‘stable’ vs. *Kuhstall* ‘cowshed’ cannot be accounted for. Some of his observations may be true when pertaining to existing lexical compounds (e.g. **Huhnsknochen* ‘chicken bone’, p.100), but are untrue when put to a productivity test; cf. *Huhnverkäufer* ‘chicken seller’, *Huhnfrage* ‘chicken question’ (if singular interpretation is sought).

Wurzel's (1970) analysis of interpreting all linking elements as 'stem-forming' elements fails on a number of points. It does not explain why e.g. *Löwe*, which, according to Wurzel's analysis is already affixed with the stem-forming element *-e* is not free to enter compounding as it stands, but requires the affixation of an **additional** stem-forming element, *-n*. It also does not explain why there is a range of examples which can enter compounding without having undergone stem-affixation (*Kirch-hof*, *Schul-tasche* etc. see IV.2.6 below). Furthermore, some of the defining qualities that are attributed to the stem-forming elements do not hold true; rather than not being required for derivation, there are numerous cases where what Wurzel analyses as a stem-forming affix attaches prior to the attachment of a derivational affix, e.g. *Heldentum*, *Studentenschaft* etc. I hope to show in the two analyses below that likening the linking elements to inflectional affixes is much more helpful and yields a greater number of generalisations than treating them as stem-forming affixes. In the example *Löwe* above, the reason for the insertion of the linking element *-n-* lies in the item's membership to a particular inflectional class **irrespective of the semantics of the final compound**, and the presence of the *-n-* need not be stipulated via insertion of a '**non-nominative singular** stem-forming element'.

Žepić (1970) is, as far as I am aware, the only author who deals with linking elements in detail. He observes the similarity between linking elements and inflectional affixes in the noun declension and bases his analysis on this: the inflectional paradigms of all nouns are listed, and, depending on which linking elements occur in which classes, observations are made. The problem with Žepić's approach (for my purposes here) is threefold:

- (1) Žepić's aim is to arrive at an adequate definition of compounding in German, and the study of linking elements in compounds is for him simply the means to this end. He is interested in the semantic relationship between A and B in a compound [AB], and indeed, the entire second half of his book presents a Marchand-style analysis of compounding. This means that the nature of linking elements is not questioned; Žepić

sees them as morphemes, but **not** as identical with inflectional affixes (for semantic reasons), but he does not attempt to prove this.

(2) Since Žepić does not believe linking elements to be inflectional, the paradigms do not discriminate between umlauted and non-umlauted nominative plural formations, because he believes that “... daß die Abwesenheit eines Pluralzeichens in der morphologischen Struktur für die inhaltliche Beziehung der Kompositionsglieder zueinander irrelevant ist.”³⁶ (Žepić, 1970:25).

(3) Lastly, because Žepić’s main objective is an adequate classification of compounds, no generalisations regarding linking elements are being made. Some of his observations are very accurate, “Die längere Form *-es-* kommt als Verbindungsmorphem nach gleicher Gesetzmäßigkeit vor wie im Genitiv Singular (...). Bei den Substantiven, die in der Flexion dieses Morphem nicht aufweisen, kommt nur die kürzere Form *-s-* vor.”³⁷ (Žepić, 1970:25). Others, on the other hand, are wrong: “Das Verbindungsmorphem *-Ø-* kann in jedem Flexionstyp vorkommen”³⁸ (Žepić, 1970:31).

For more criticism of the transformational analysis of compounds in Žepić (1970) see Abraham (1969) and Allerton (1971). However, it is from ideas in Žepić (1970) that I have developed the two different analyses I present below.

One of the most recent approaches to the problem of linking elements in German compounds can be found in Wiese (1996a). He calls linking elements ‘morphemes’, but without committing himself as to whether this is really what they are. He also points out arguments which may be used to argue for the inflectional status of these elements (e.g. the fact that they are outwardly identical with inflectional affixes) and against, namely the semantic difficulties and the exceptional behaviour of *-s-*. His solution proposes to treat linking elements not as a homogeneous group, but to treat *-s-* separately from all others.

³⁶ ‘... that the lack of a plural sign in the morphological structure is irrelevant for the relationship of the content of the compound members to each other.’

³⁷ ‘The longer form *-es-* occurs as a linking element following the same rules as in the genitive singular (...). Nouns, which lack this morpheme in their inflection, will only ever have the shorter form, *-s-*.’

³⁸ ‘The linking element *-Ø-* can occur in every inflectional type.’

This, as a basic proposal, is very useful, but Wiese's analysis is restricted by the scope of the book and deals mainly with lexicalised, and hence largely unexplainable data (cf. *Mausefalle* 'mousetrap' Wiese, 1996a:145). He proposes a consonant insertion which I will describe in more detail in IV.2.1 below. Wiese (1996a:145) also casts doubt at the usefulness of stratification as a means to structure insertion rules; pointing out that the following operation is clearly wrong:

- a. derivation *Schwing+ung*
- b. affixation *Schwingung+s*
- c. compounding *Schwingungs+zahl*

The problem here is that the affixation (in b.) of *-s* to *Schwingung*, a derived noun which does not have *-s* in its inflectional paradigm at all is ungrammatical. It would never take place unless it was already clear at that point in the proceedings that the only reason *-s* is being inserted at this point is to allow for compounding in the next round of rule applications. Or, put another way, at the level of affixation, nothing can tell the affected noun that it is about to enter compounding, which would legitimise the affixation. Thus, c. is a necessary condition for b., and without c., b. could not happen. The proposal then amounts to the kind of sneak-preview which is not allowed in LP. As indicated above, I will aim to have compounding located at two strata and not just one, to avoid this kind of non-grammatical and unmotivated insertion of linking elements. The only solution appears to be an insertion of the linking element **after** the compounding has taken place.

Various authors, among them Anderson (1992) and Thomas-Flinders (1983:120) reject the notion that linking elements in German compounds could be inflection. Anderson (1992:296), using the particularly awkward *-en-* in *Schwanengesang* 'swan song' as an example, suggests that a linking element "has no discernible purpose apart from serving as 'glue' in the compound". He does not comment on any other German examples, and argues

(based on English data) that all compounds are created by syntactic structures, and that linking elements are inserted by rules applying specifically to compounds. Thomas-Flinders (1983:120ff) maintains that these forms are “pseudo-inflected, ... these are not cases involving rule-governed inflectional processes ... In fact it seems that German nouns must be lexically specified for the forms they may take in compounds and derived words.” I will try to show that these claims are clearly wrong; linking elements undeniably share numerous properties with inflections and the majority of linking elements will turn out to **be** inflections. Furthermore, it will become clear that there is compelling evidence that their appearance is governed by striking generalisations if not by strict rules. The lexical specification of each noun as to what linking elements may occur is unnecessary in as much as this can be shown to be linked by rule to the categories; however, what may need to be listed is the information of whether or not an item will take a linking element in a given combination, for lexicalised examples.

IV.2 Analysis (1)

This analysis deals with ‘dictionary entry’ compounds, i.e. lexicalised and formalised forms. One noticeable quality of linking elements is that they look like inflection: they form a proper subset of inflectional affixes. More to the point: the set of linking elements consists entirely of possible nominative plural and genitive singular inflection. In all examples the set of linking elements that is available for insertion in the environment $[[N_1] \text{ — } [N_2]]$ depends on the inflectional class of N_1 . The nominative singular (always -Ø), the genitive singular and the nominative plural of N_1 are the first primary determinants for the choice of linking element for this item. This automatic availability of at least two linking elements (and -Ø-) for each noun will be called ‘licensing’: A linking element is licensed for insertion after N_1 if it is N_1 ’s nominative singular or genitive singular or nominative plural inflection.³⁹

³⁹ -s- will prove to be somewhat different from the rest, cf. IV.2.1.

‘Licensed’ linking elements are the inflectional endings for

- a. nominative singular
- b. genitive singular
- c. nominative plural

Thus:

$$\left[\begin{array}{l} \text{[N]}_{\text{MASC, NEUT}} \\ \text{Nom. Sg.} \\ \text{Gen. Sg.} \\ \text{Nom Pl.} \end{array} \right] \rightarrow \left[\text{[N]} \begin{array}{c} \left\{ \begin{array}{l} \text{-a-} \\ \text{-b-} \\ \text{-c-} \end{array} \right\} \end{array} \right] / \left[_ \text{[N]} \right]$$

-a-, -b- and -c- are licensed (permissible) linking elements that may occur after $[\text{N}]_{\text{MASC, NEUT}}$ when it enters into compounding.

As indicated in IV.1, the following analysis represents only one of two which will be offered in this chapter. Here, the analysis takes the individual linking element as the starting point, and observes its occurrence in various classes and environments⁴⁰. This initially seemed the most natural way to group the phenomena, and, as will be shown in IV.2.8, there are some generalisations to be made with respect to some linking elements. I would like to note at this point, however, that all ‘rules’ proposed in section IV.2 are of a very tentative nature. It is only after the second analysis in IV.3 (where productivity is taken into account) that productive rules can be formulated.

To improve the possibilities for comparison between the separate linking elements, I have chosen to re-structure the German noun paradigm slightly. I have separated out classes which in most German grammars (see Appendix) would be conflated, distinguishing e.g. between ‘masculine III’ (Gen. Sg.: *-(e)s*, Nom. Pl.: *-e*) and ‘masculine IV’ (Gen. Sg.: *-(e)s*, Nom. Pl.: *-e* [umlaut]). This is a necessary means to determine just how ‘inflectional’ linking elements actually are, i.e. to what extent we can assume to be dealing with meaningful morphemes, rather than empty filler segments. For example, the occurrence of the umlaut in class MASC. IV. in conjunction with the ‘linking element’ *-e-* in the first

⁴⁰ The second analysis in IV.3ff will move in the opposite direction, i.e. start with the separate declension classes and determine the distribution of the linking elements.

element of a compound suggests a plural interpretation, and not merely the insertion of /ə/ for prosodic or phonotactic reasons. My aim is to prove the unambiguous status of linking elements as inflectional affixes (except -s-) based on morphological and syntactic criteria. I will attempt to show that semantic criteria are not sufficiently accurate to discount strong morphological and syntactic evidence in favour of the linking element's inflectional status. The nature of compounds is such that number in particular need not be expressed as there is the possibility of referring to something 'generically'. An *apple cake* (*Apfelkuchen*) is a **kind** of cake, and it is beside the point to argue that it contains more than one apple, which the inflection (here: umlaut) should show.

Analysis (1) takes the following format: I will examine each linking element in a separate section. At the beginning of each section, there will be a table giving examples of the occurrence or non-occurrence of the linking element in each inflectional class. If there is an obvious reason for the absence of the linking element, then the empty slots will be marked. Marking will also occur if the presence or absence is in any way 'out of the ordinary'. The subsequent discussion will comment on each class in turn, noting if the linking element under discussion is 'licensed' in each class, and to what extent the licensing accurately predicts the presence or absence of the linking element. At the end of each section, an attempt is made to formulate either rules or at least generalisations that appear to hold true based on the facts as they have been presented so far.

As will become clear throughout the more detailed analysis, -s- poses a problem inasmuch as it does **not** (in fact, never) occur where it is present in the Nom. Pl., but it **does** occur where it is not licensed (all through the Fem. paradigm). I am therefore proposing to treat -s- as quite distinct from all other linking elements (cf. Wiese, 1996a:144), initially just based on the observation that its behaviour is radically different from that of all others.

The distinction in the kinds of linking elements that apply lies thus between ‘licensed’ linking elements and ‘default’ linking elements. The licensed elements are inflectional endings from either genitive singular or nominative plural (or both), or -Ø, which may be present in the juncture position of nominal compounds. The default linking element is -s, when it occurs in environments where it is not licensed.

Before I proceed to look at the individual linking elements and their environment in more detail, I insert a table which offers an overview of the noun declension in German. The Appendix shows all other case endings; the table here only indicates genitive singular and nominative plural, as these are the only two case endings of relevance to the study of linking elements. The table is based on categories suggested in Žepić (1970), Helbig & Buscha (1979), Bittner (1994), Harnisch (1994), Wurzel (1994) and Duden Grammatik (1995), but, as indicated above, extended to facilitate a comparison between as many distinctions as are relevant for my purposes.

TABLE (A)

Noun categories	Examples
MASCULINE	
I. -s, --	<i>Sommer, Käfer, Sessel, Strudel, Schatten, Kuchen, Lehrer, Himmel, Onkel, Tadel, Hobel, Tunnel, Balken, Knochen, Koffer, Ärmel, Besen, Schwimmer, Frieden</i>
II. -s, -- (Umlaut)	<i>Apfel, Nagel, Ofen, Garten, Bruder, Acker, Sattel, Vogel, [Handel], Hafen, Laden, Hammer</i>
III. -(e)s ⁴¹ , -e	with -es: <i>Tag, Hund, Erfolg, Beweis, Prozeß, Reflex, Dienst, Stern, Grad, Krebs, Freund, Fisch, Verlust, Mond, Dolch</i> with -s: <i>Inhalt, Film, Lehrling, Monat, Schuh, Käfig, Regisseur, Dekan, Delphin, Zwilling, Sekretär, Masseur, Greis, Kommissar, Liebling, Beruf</i>
IV. -(e)s, -e (Umlaut)	<i>Absatz, Traum, Marsch, Ast, Frosch, Knopf, Stamm, Kampf, Arzt, Damm, Ball, Schwanz, Ertrag, Genuß, General, Gast, Bart, Hahn</i>
V. -es, -er (Umlaut)	<i>Mann, Geist, Irrtum, Mund, Wald, Wurm, Leib, Gott, Rand, Reichtum</i>

⁴¹ -es: after -s, -ß, -x, -tsch, -z, as well as after many monosyllabic words. -s: after polysyllabic words ending in an unstressed syllable; after vowels; after nominalised verbs or adjectives, e.g. *des Grüns, des Seins*. Variation may occur after polysyllabic words ending in a stressed syllable (*Erfolg, Getränk*) and after compounds, cf. *des Fremdwort(e)s, des Bergwerk(e)s* (but: *des Wortes, des Werkes*).

VI. -(e)n, -(e)n ⁴²	with -en: <i>Bär, Held, Mensch, Narr</i> (all monosyll.), <i>Elefant, Optimist, Konsonant, Präsident, Kandidat, Planet, Pilot</i> (all final stress) with -n: <i>Bote, Junge, Genosse, Erbe, Gatte, Insasse, Kollege, Laie, Neffe, Hase, Affe, Nachkomme, Löwe, Pädagoge, Franzose</i> (all end in schwa); <i>Herr</i> (Nom Pl: -en)
VII. -(e)s, -(e)n	<i>Staat, Schmerz, Dorn, Muskel, Nerv, Pantoffel, See, Fleck, Mast, Pfau, Schreck, Stachel, Strahl, Typ, Untertan, Vetter, Diktator.</i>
VIII. -(e)s, --	<i>Bedarf, Hunger</i>
IX. -ns, -n	<i>Name, Buchstabe, Gedanke, Wille, Glaube</i>
X. -s, -s	<i>Park, Opa, Uhu, Karton, Pulli, LKW, Pier, Tip, Vati, Akku, Fan, Cocktail</i>
FEMININE	
I. --, -- (Umlaut)	<i>Mutter, Tochter</i>
II. --, -e	<i>Kenntnis, Erlaubnis, Erkenntnis</i>
III. --, -e (Umlaut)	<i>Auskunft, Zusammenkunft, Ankunft, Hand, Gans, Kraft, Ausflucht, Stadt, Macht, Sau, Nacht.</i>
IV. --, -(e)n	<i>Geburt, Frau, Universität, Qualität, Frequenz, Klinik, Kritik, Frisur, Explosion, Kopie, Distanz, Chronik, Nase, Wange, Sardelle, Geschichte, Etage, Familie, Arie, Bank, Komödie, Asche, Kommode, Melone, Rakete, Gasse, Nation, Prozedur, Reportage, Leber, Jagd, Liebe, Kirche.</i>
V. --, --	<i>Anmut, Gewähr, Gesundheit</i>
VI. --, -s	<i>Oma, Lok, Bar, Party, Saison</i>
NEUTER	
I. -s, --	<i>Leben, Fenster, Märchen, Schnitzel, Pendel, Kabel, Lager, Messer, Becken, Eisen, Kissen, Gewebe, Häuschen, Büchlein., Gewebe</i> With UMLAUT: <i>Kloster, Heldentum, Wachstum</i>
II. -(e)s, -e	<i>Brot, Meer, Fest, Zeugnis, Boot, Jahr, Schnitt, Gewürz, Getränk, Gefäß, Gewicht, Recht, Glück (no Pl), Bein, Ballett, Instrument, Beil, Krokodil, Adjektiv, Motiv, Klavier, Vitamin, Lineal, Inserat, Suffix, Modell, Magazin, Telefon, Ventil, Werk, Bergwerk; Gefängnis, Hindernis, Ereignis, Geheimnis (cf. -nis exx. in FEM. II.)</i> With UMLAUT: <i>Floß</i>
III. -(e)s, -er (Umlaut)	<i>Gesicht, Amt, Land, Haus, Buch, Gespenst, Wort, Ei, Lied, Lamm, Dorf, Korn, Loch, Brett, Kind, Kleid</i>
IV. -(e)s, -(e)n	<i>Hemd, Bett, Elektron, Auge, Interesse</i>
V. -ens, -en	<i>Herz</i>
VI. -s, -s	<i>Echo, Sofa, Wrack, Hoch, Tief, Genie, Hotel, Atelier, Korsett, Brikkett, Porträt, Deck, Detail, Mannequin (n.b. - predominantly loans)</i>

⁴² With -en after all consonants except -el, -er and after -au and -ei. Only with -n after all vowels, except -au and -ei, and after -el, -er. (See also Fem. IV.)

IV.2.1 -(e)s-

“Zum Gebrauch von *-es-* oder *-s-* lassen sich - über die Feststellung hinaus, daß es nach bestimmten Verschluslauten (*p, t, k*) und *f* kaum *-es-* auftritt, keine weiteren Regeln geben.”⁴³ (Fleischer, 1974:125)

With its first occurrence in MHG and Lower German⁴⁴, *-(e)s-* is, along with \emptyset , the most frequent linking element, occurring as just *-s-* in the majority of cases. Its varied distribution shows that very few restrictions seem to apply: *Betriebsausflug*, *Erwerbsfähigkeit*, *Versicherungsvertreter* and *Bereitschaftsdienst* only ever have *-s-*; *Kalbsleberwurst* alternates with *Kalbfleisch*, *Grabinschrift* with *Grabesstille*, *Diebstahl* with *Diebesgut*, *Lobgesang* with *Lobeshymne*; and *Landhaus* with *Landsmann* and *Landesfarben*.

-s- stands frequently after complex items (particularly feminines which are compounds, prefixed or derived via *-schaft*, *-ung*, *-heit*, *-keit*, *-tum*, *-ur*, *-ion*, *-tät*, *-ing*, *-ling*⁴⁵). As Thomas-Flinders (1983:126) puts it: “... the suffixes *-ung* and *-heit* always take an /s/ suffix in compounds, even though they never occur in isolation with an /s/. It is difficult to see how rules could be constructed to account for these facts.” I will try to do just that.

I would like to assume as a working hypothesis that *-es-* occurs where it is also a potential Gen. Sg. inflection of the form (i.e. is only found after nouns, which have *-es-* in their inflectional paradigm), while the linking element *-s-* may also occur in those cases which do not have *-s-* in their genitive forms in the inflectional paradigm. To gain an overview of all possible forms, and to verify this hypothesis, I would like to examine table (a) (part of the data stemming from Žepić, 1970) in some detail. The table is organised in the categories of gender, which are subdivided into the various inflectional classes of the nouns. Thus a direct

⁴³ ‘As to the usage of *-es-* or *-s-* no further rules can be given, except for the observation that after certain plosives (*p, t, k*) and *f* *-es-* is rarely found.’

⁴⁴ Frequency of *-s-* as linking element before certain suffixes has increased since then, cf. Bauer (1983:52) on Luther’s *Gerechtigkeitliebe* vs. today’s *Gerechtigkeitsliebe*.

⁴⁵ Even though large number of these examples are abstract nouns (e.g. *Freundschaft*, *Einigkeit* etc.), this cannot be the only reason for this group’s attraction of *-s-*, because there are also numerous examples of concrete nouns with *-s-*: *Zeitung*, *Herzogtum*, *Nation*, *Liebling* etc. I will analyse suffixes and their relation to the various linking elements in IV.3.13 below.

comparison can be made, between the Gen. Sg. and Nom. Pl. forms, and the potential linking elements that are available for each example:

TABLE (B)

noun categories	-s- linking element	-es- linking element
MASCULINE		
I. -s, --	<i>Frieden-s-pfeife, Frieden-s-stifter, Himmel-s-körper, Himmel-s-kraft, Himmel-s-zelt, but: Himmelreich (old?)</i>	* (see Gen Sg)
II. -s, -- (Umlaut)	<i>[Handel-s-kammer], Vogel-s-berg (lexicalised) but: Bruderliebe, Brüdergemeinschaft</i>	* (see Gen Sg)
III. -(e)s, -e	<i>Inhalt-s-verzeichnis, Monat-s-karte, Zwilling-s-paar, Liebling-s-buch, Hund-s-tage</i>	<i>Tag-es-licht, Tag-es-zeitung, Freund-es-kreis</i>
IV. -(e)s, -e (Umlaut)	<i>Ertrag-s-steigerung, General-s-stab, Beruf-s-erfahrung</i>	<i>Stamm-es-ältester</i>
V. -es, -er (Umlaut)	<i>Mann-s-bild, Irrtum-s-sucher, Reichtum-s-verwalter</i>	<i>Geist-es-abwesenheit, Mann-es-kraft, Leib-es-kräfte, Gott-es-dienst</i>
VI. -(e)n, -(e)n	* (blocked by Gen Sg) OR blocked bec. of prosodic make-up of nouns?	* (blocked by Gen Sg)
VII. -(e)s, -(e)n	<i>Staat-s-angehörigkeit</i>	*?!
VIII. -(e)s, --	<i>Bedarf-s-fall, Hunger-s-not</i>	*?*
IX. -ns, -n	* (but see IV.2.3)	* (see Gen Sg)
X. -s, -s	* (blocked by Nom Pl) cf. also Fem. and Neut	* (see Gen Sg)
FEMININE		
I. --, -- (Umlaut)	<i>Mutter-s-mutter</i>	* (see Gen Sg)
II. --, -e	<i>(Trübsal-s-haft)</i>	* (see Gen Sg)
III. --, -e (Umlaut)	<i>Auskunft-s-stelle</i>	* (see Gen Sg)
IV. --, -(e)n	<i>Geburt-s-tag, Geburt-s-haus, Qualität-s-kontrolle, Heirat-s-schwindler, Liebe-s-brief, Universität-s-stipendium</i>	* (see Gen Sg)
V. --, --	<i>Gesundheit-s-zustand, Gewähr-s-mann</i>	* (see Gen Sg)
VI. --, -s	* (blocked by Nom Pl)	* (see Gen Sg)
NEUTER		
I. -s, --	<i>Leben-s-künstler, Gewissen-s-bisse, Wachstum-s-schaden, Heldentum-s-drang, Geweb-s-flüssigkeit</i>	* (see Gen Sg)
II. -(e)s, -e	<i>Recht-s-anwalt, Glück-s-ritter, Gewicht-s-klasse, Gespräch-s-</i>	<i>Meer-es-spiegel, Jahr-es-wechsel</i>

	<i>partner, Boot-s-haus</i>	
III. -(e)s, -er (Umlaut)	<i>Gesicht-s-wasser, Amt-s-richter, Kind-s-kopf, Land-s-mann</i>	<i>Land-es-grenze, Lamm(e)sgeduld</i> (both in Duden), <i>Kind-es-mißhandlung</i>
IV. -(e)s, -en	<i>Hemd-s-ärmel</i>	
V. -ens, -en	* (see Gen Sg)	* (see Gen Sg)
VI. -s, -s	* (blocked by Nom Pl)	* (see Gen Sg)

MASC. I. and II.: -s- linking element is licensed and therefore may occur, but is rare; the preferred linking element in these paradigms is the nominative singular, -Ø- (*Sommerfrische, Kuchenheber*), c.f. IV.2.6 below. -es- is impossible, because it doesn't feature in the paradigm. The reason for this is the fact that all items in this class end in a syllabic sonorant - or, more specifically, an unstressed /ə/ syllable - (they are in fact all dissyllabic). -s- generally denotes genitive case in both MASC. I. and II., e.g. in *Friedensstifter, Himmelskraft, Handelsgesellschaft* etc. but is still not as frequent in this class as no linking element at all.

MASC. III. and IV.: -s- is possible for those items that have -s in the Gen. Sg.; -es- is possible for those items that have -es in the Gen. Sg., but no linking element at all seems to be the preferred option again. Those items that show variation of -(e)s in the Gen. Sg. only have -s- as the linking element. However, the -s- linking element does not necessarily correspond with the semantics of genitive (*Zwillingspaar* 'pair of twins') - just as genitive semantics does not have to be marked by -(e)s- (*Filmvorführung* 'film projection'). In other words, semantic criteria appear to be inapplicable in these classes.

MASC. V.: The Gen. Sg. -es seems to enable the items to have both -s- and -es- as linking elements. Variation as to the presence and absence of schwa may be lexicalised, since this is very rare. It is notable that complex items (i.e. *Reichtum, Irrtum*) **always** have a linking element, which is always -s-. SEE IV.3.13 on [[N suffix] _] [N]], also IV.3.14 on [[[N][N] _] [N]].

MASC. VI.: Neither *-s-* nor *-es-* are available. *-es-* is not licensed because it does not feature in the inflectional paradigm of this class. *-s-* however is blocked by either (a) The fact that there is not Gen. Sg. in *-(e)s* which would license *-s-* as a linking element, or (b) There **is** a competing Gen. Sg. inflection *-(e)n* which blocks the application of the default *-s-*. (This default application of *-s-* occurs e.g. throughout the Feminine paradigm, where *-s-* is not licensed, but isn't blocked either, so it applies freely across the board as the default linking element.) As will be shown in the discussion of *-(e)n-* below, items from the MASC. VI. paradigm are eligible for taking *-(e)n-* as a linking element, and do so **exclusively**. Moreover, no item in this class ever occurs without the *-(e)n-* link.

MASC. VII.: Theoretically, both *-s-* and *-es-* should be available, because they are licensed in the paradigm. The fact that *-s-* is comparatively rare, while *-es-* does not seem to occur at all is very interesting. I suspect this is related to the Nom. Pl. inflection *-(e)n*, which seems to dominate over *-(e)s-* wherever it occurs. So the actual reason for the insignificant number of occurrences of *-(e)s-* as a linking element in this particular class is most probably linked to the increased likelihood that **other** linking elements will occur. The application of *-(e)n* as a linking element needs to be ordered above the application of *-(e)s-*. Thus, if *-(e)n-* is present in a paradigm, it will occur. If it is not present, *-s-* is a possible default application.

MASC. VIII.: *-s-* is available and, because of the Gen. Sg., *-es-* should also be available, but isn't. However, this is much too small a group to come up with any kind of valid generalisation.

MASC. IX.: There are not many examples in this class, but the occurrence of linking elements is quite consistent with earlier findings: Gen. Sg. dictates the shape of the linking element. Neither *-s-* on its own or *-es-* are possible options, because the Gen. Sg. is *-ns*.

Again this seems to indicate that if a competing Gen. Sg. form is available, it will dominate over the insertion of default *-s-*.

MASC. X.: only *-s* appears in the inflectional paradigm. Thus, *-es-* is not an available option. However, *-s-* is also banned: the appearance of *-s* in the Nom. Pl. seems to **block** the application of *-s-* as a linking element. This generalisation holds true across the genders, cf. FEM. IV. and NEUT. VI. below. One good reason to assume blocking in these instances is that *-s-* is more frequently associated with genitive semantics (*-s* as a Nom. Pl. inflection is a comparatively rare and also recent occurrence, also mainly found in abbreviations, new and/or loan words), and therefore in instances where it might be confused with the Nom. Pl. is blocked from appearing altogether. This argumentation is very much along the lines of Chapman's (1995a, 1995b) concept of 'perceptual salience'⁴⁶, or Humboldt's Universal; for details see V.3.3 in chapter V.

A first generalisation can now be made. It is, as far as I can see, exceptionless.

If the Nom. Pl. of any noun N_1 is *-s*, this noun will not take *-s-* as a linking element in a compound $[[N_1] _ [N_2]]$.

FEM. nouns tend towards *-s-* linking element with increased frequency, even though (or because) it is not in the paradigm **at all**. I have chosen to class the occurrence of *-s-* throughout the Feminine paradigm (with the exception of FEM. VI.) not as a 'licensed' one, because *-s-* in fact never occurs in the feminine paradigm. However, the general default status of *-s-* makes it possible to treat this particular linking element as quite different from the others. I will thus try to defend the decision to interpret *-s-* as being '**not blocked**'

⁴⁶ The same principle may apply in English compounding, where regular plural inflection is rare in the juncture position of a compound. It can perhaps be argued that there, too, *-s-* is associated more frequently with genitive semantics, and therefore to avoid misinterpretation is not inserted in a position where it could mean either 'Gen. Sg.' or 'Nom. Pl.' however, to make such a case for English will be much more difficult, because *-s* is simultaneously by far the most frequent plural affix. The semantic arguments hold much better for German.

throughout the feminine paradigm not on the strength of it being the Gen. Sg. inflection (which it isn't), but rather **because there are no competing Gen. Sg. inflectional affixes**, which would block the default *-s-* from application (compare e.g. MASC. VI, where *-(e)n* in the Gen. Sg. blocks any application of *-s-*). The default character of *-s-* will subsequently be further strengthened by its appearance after complex N_1 , i.e. suffixed N_1 (in $[[N_1 _] [N_2]]$) and $[[[N][N] _]_1 [N_2]]$. In both these cases, *-s-* is by far the most frequent linking element, and in the second case, the only one.

Throughout the feminine paradigm, *-es-* as a linking element is not available at all, because it never features in the inflectional paradigm. *-s-* however is widely available, with a few exceptions.

FEM. I. is too small a class to say much about. The only licensed linking element in this paradigm is \emptyset (in combination with umlaut for plural), but *-s-* applies as the default linking element throughout the FEM. paradigm (except in FEM. II. (for phonotactic reasons) and VI. (for morphological reasons)); here: *Muttersmutter*.

FEM.II: While *-es-* does not occur (not licensed in the paradigm), the default link *-s-* is blocked from applying in this class for phonotactic reasons, in all examples which end in *-s*; *Erkenntnis*, *Erlaubnis* etc., but may occur after examples in *-sal*; *Mühsal*, *Trübsal*.

FEM. III.: *-s-* as a default occurs here; however, mainly after 'complex' items, such as *Auskunft-*, *Ankunft-*, *Zusammenkunft-*, *Ausflucht-*. With the other examples, *-s-* as a default is not required, since *-Ø-* and *-e-* are licensed and are both occurring frequently, hence, e.g. *Städteplaner* or *Stadtrat*, but not **Stadts-* or **Krafts-* or **Hands-*. Considering the default application of *-s-* elsewhere in the FEM paradigm, a powerful blocking condition must be in place here. Either it is similar to the blocking in MASC. where competing licensed linking

elements dominate over *-s-* (here: *-Ø-* and *-e-*) or *-s-* is blocked ‘after monosyllabic items in this group’. The latter generalisation is rather random, and not very good.

FEM. IV.: *-s-* can occur as a default in this class; not, however, after vowels or /s, ʃ/ except *Liebe-s-brief* etc. It can in some cases be interpreted as genitive (cf. *Geburtstag* ‘birthday’ (genitive semantics) vs. *Geburtenkontrolle* ‘birth control’ (plural semantics)). It is noticeable in this class though, that the default *-s-* only applies in cases where the much more frequent and prominent *-(e)n-* fails to apply. The difference is again that both *-(e)n-* and *-Ø-* are licensed in the paradigm, whereas *-s-* only applies where these licensed linking elements have failed to apply. *-s-* is predominant in this class only after complex items; e.g. *Qualität-, Universität-*, but it does not seem to occur after morphologically simplex items⁴⁷.

FEM. V.: Since the only inflectional affix which is licensed as a linking element is *-Ø-*, the default *-s-* is also possible. Both occur; whereby some alternations occur: *Gewähr-leistung* vs. *Gewähr-s-mann*. Only the affixed *Gesundheit* can only ever occur with the *-s-* linking element, and never without it.

FEM. VI.: *-s-* is blocked by its presence in the Nom. Pl. of the class, see MASC. X. above. The only possible linking element for this class is *-Ø-*.

NEUT. I.: *-s-* is licensed, but is slightly more restricted in its appearance than the other licensed linking element, *-Ø-*. Judging from the available examples here, *-s-* seems to be blocked after *-el* and *-er*; not, however, after *-en*; cf. *Leben-s-abend* vs. **Fensters-*, **Schnitzels-*. However, as will become clear in the analysis in IV.3.1.c this occurrence of *-s-*

⁴⁷ I am however not sure whether it would be appropriate to interpret *Geburt* as morphologically complex just because it takes the linking element *-s-*. One possible solution is to assume *Geburt* to be a lexical exception. However, see IV.3.13 for other examples of this kind (*Gebirge* → *Gebirgs-*, but *Gemälde* → **Gemälds-*).

in *Leben* is exceptional and there is no difference between *-en* vs. *-el* and *-er*. *-s-* **must** occur after the affixed forms *Wachstum*, *Heldentum*.

NEUT. II.: Both *-s-* and *-es-* are licensed in the Gen. Sg. Both occur with relative comparable frequency, but not necessarily with a true relation to genitive semantics. Cf. *Gewichtsklasse* 'weight class' vs. *Gewichtheber* 'weight lifter', *Meeresgrund* 'bottom of the sea' vs. *Meerenge* 'straits'. *-s-* does not occur after /s/ or /ʃ/.

NEUT. III.: Both *-s-* and *-es-* are licensed in the Gen. Sg. *-s-* however is more frequent than *-es-*, even in those items where the Gen. Sg. is *-es*. In some of these examples, however, a noticeable semantic difference between the linking elements *-es-* and *-s-* can be observed: cf. *des Kindes* (Gen. Sg.) vs. *Kindesmißhandlung* ('child abuse, i.e. abuse **of a** child') vs. *Kindskopf* (**not** a 'child's head', but exocentric 'simpleton'). It is visible here, then, that the original Gen. Sg. inflection of an item is used only in those formations where the interpretation of genitive is sought; *Kindeskopf* would point towards such an interpretation ('head **of a** child'), whereas *Kindskopf* is very definitely not genitive.

The difficulty of finding more examples like this in this class lies in the fact that the Gen. Sg. is not unambiguously *-s* or *-es* in all cases, but sometimes both variants are permitted, cf. *des Gesicht(e)s*. Here, only *-s-* ever occurs as a linking element, irrespective of Gen. semantics: *Gesichtswasser* 'face lotion' (not Gen.) vs. *Gesichtsdruck* 'facial expression', *Gesichtszüge* 'facial features' (Gen.).

NEUT. IV.: Both, *-es-* and *-s-* are licensed. *-es-* however is quite rare in the paradigm, and therefore does not seem to occur as a linking element; *-s-* is very rare. The Nom. Pl. linking element *-(e)n-* appears to be far more frequent and more productive than the others. Again, it

seems to be true to say that if *-en-* is available as a linking element, it occurs comparatively frequently, cf. MASC. VI., VII. and FEM. IV.

It can be seen from this overview that *-s-* as a default (i.e. not licensed, but applying widely across the board) is the most frequent linking element in the feminine paradigm, with the exception of FEM. II. - simply because all examples here end in *-s* anyway; and FEM. VI, where the blocking of *-s* as a Nom. Pl. inflection outweighs the appearance of *-s-* as default. The FEM. paradigm shows most clearly the restrictions of the linking elements; if *-es-* does not occur in the Gen. Sg., it is also not a possible option in the choice of linking elements that are available for any given word. *-s-* however is quite different, in that it occurs in the FEM. classes as a linking element, even though it is not in the paradigm. This may well be a spreading of what is quite possibly the most common linking element from those words where it was originally the Gen. Sg. inflection (as well as the linking element) to words where the Gen. Sg. was formed differently (cf. Fleischer (1974:123), Wilmanns (1896:519)). Again, *-s-* is prohibited in the one class that does have it in the Nom Pl. inflection, FEM. VI.

In the NEUT. paradigm, the insertion of *-s-* and *-es-* is regular all the way through; *-s-* is possible everywhere, except in VI. where it occurs in the Nom. Pl.; while *-es-* is only permitted where it is also in the Gen. Sg. (n.b. also: **only** for those forms that do have *-es-*, and not the schwa-less variant, if that is permitted in the class). A potential problem is the lack of *-es-* in IV., where it should technically be allowed; I can only assume that with only three items to choose from, the option that is not all that popular anyway is simply not taken up.

Irrespective of whether *-s-* is interpreted as a linking element or as an inflection, it is necessary to be aware of the fact that the occurrence of *-s-* depends on morphological information. One condition imposed by the paradigms with regard to *-s-* is that it must **not**

be in the plural; no class that has *-s* in the nominative plural ever has linking *-s-*, *-es-* on the other hand is exclusively dependent on the presence of this form in the genitive singular in the paradigm; if a word does not have *-es-* in the Gen. Sg., it will not take *-es-* as a linking element.

There are numerous motives for treating *-s-* differently from all the other linking elements (including *-es-*), particularly where the occurrence of *-(e)s-* in the inflectional paradigm is concerned. While *-s-* is one of the (rarer) plural affixes, it **never** occurs as a linking element after nouns which take plural *-s*; cf. *Taxis*, *Parks*, *Kinos*, *Ufos*, *LKWs* etc. but: *Taxi-fahrer*, *Park-bank*, *Kino-karte*, *Ufo-spezialist*, *LKW-schein*. Furthermore, *-s* never occurs after *-ung*, *-heit* etc. or feminine nouns in general as a plural or genitive affix in the inflectional paradigm, but is very regularly found as a linking element in these examples; cf. **Beratungs*, **Freiheits*, **Freundschafts*; but: *Beratung-s-stelle*, *Freiheit-s-kämpfer*, *Freundschaft-s-beweis*. Unlike all other linking elements, *-s-* is not linked to the inflectional affixes in the paradigms, and is also not conditioned by them - with the exception of its being blocked by *-s_{pl}*. I therefore propose to treat *-s-* as a genuine linking element, and not as inflection.

Possible rules for the insertion of *-s-* as a linking element:

(1) $\emptyset \rightarrow s$ / nouns which have the nominative plural in *-s*, nouns which end in *-s*, any item from class MASC. IV. (This formulation loses the generalisation that the appearance of *-s-* in the Gen. Sg. is not a relevant factor in the feminine paradigm, whereas in MASC. and NEUT. it **is** relevant.)

(2) $\emptyset \rightarrow s$ / elsewhere

OR:

1. $\emptyset \rightarrow s$ / MASC.: in all paradigms that have *-s-* in the Gen. Sg., but not where *-s* is the Nom. Pl. inflection or where the uninflected form ends in *-s*.

2. $\emptyset \rightarrow s$ / FEM.: in **all** paradigms **irrespective of presence in the Gen. Sg.**, except where *-s* is the Nom. Pl. inflection or where the uninflected form ends in *-s*.

$\emptyset \rightarrow s$ / NEUT.: in all paradigms that have *-s-* in the Gen. Sg. (which is all of them), except where *-s* is the Nom. Pl. inflection or where the uninflected form ends in *-s*.

As will become clear in the second analysis in IV.3 below, these generalisations are much too broad and miss a number of characteristics that are peculiar to *-s-*.

Rules for the insertion of *-es-* as a linking element:

(1) $\emptyset \rightarrow es$ / possible only for forms where *-es-* also appears in the Gen. Sg. of the item's paradigm.

This leaves no explanation why *-es-* does **not** appear in MASC. VII., VIII. and NEUT. IV, even though it is licensed in those paradigms.

It can furthermore be established that it is no longer possible to interpret *-s-* synchronically as the genitive singular inflection, much for the same reasons that it cannot be the plural inflection; primarily because the occurrence has spread very productively to many words which do not have the *-s-* in their inflectional paradigm at all, but also (as pointed out in Wiese, 1996a:145) because the linking element *-s-* does not show the alternations between /s/ and /əs/ which can be found in the genitive singular inflection, e.g. *des Werk(e)s* but: *Werk-halle*, *(Bach)-Werk-e-verzeichnis*, *des Ausgleich(e)s* but: *Ausgleich-s- treffer*. Other examples where the *e* from the genitive got deleted are *Land-s-mann*, *Rat-s-herr*, *Blut-s-bruder*, *Kalb-s-kopf*, *Bock-s-horn*. Similar alternations can be observed in adjective formations; compare: *wort-brüchig* vs. *vertrag-s-brüchig*; *leid/gefühl-voll* vs. *vorwurf-s-voll* (exx. Wilmanns, 1896:520). It may therefore be futile to argue for the genitive singular in cases like *Kind-es-mißhandlung*, while having to admit that the vast majority of examples no longer have such a connection to the genitive interpretation. Thus, while *-s-* can generally be shown to have no link (except by analogy) to genitive semantics, it will prove difficult to argue for such a link where *-es-* is concerned. However, as I hope to have established above,

the morphological link between the Gen. Sg. inflection and the linking elements *-es-* is very strong.

I would now like to return to a proposal made by Wiese (1996a:144). He suggests to treat the *-s-* linking element separately from the rest; in his view, *-er-*, *-e-* and *-en-* are regular plural affixes, while *-s-* is inserted via a rule of consonant epenthesis. To account for the fact that the semantics often goes against interpreting the linking elements as plural affixes he argues that in those terms the presence or absence of a plural affix is irrelevant, because it attaches to the first element in the compound - which is not the head of the construction; the inflection of the non-head elements in a construction is not taken into account for the overall interpretation of the item. Any inflection that attaches to the head of the construction (i.e. in these cases the second noun) signals number, case etc.; cf. *Kind-er-garten* vs. *Kind-er-gärten*; *Land-haus* vs. *Land-häuser*. This also ties in with the observation that in some cases there is no plural affixation on the first element, even though the overall meaning is to be understood as ‘generic’ (in the sense of ‘the category of ...’); cf. *Auto-händler*, *Buch-laden*.

While Wiese's proposal does not contain any suggestions regarding the treatment of "regular" linking elements (other than that they are plural inflection), it does formulate a rule of consonant epenthesis (1996a:232):

a. $\emptyset \rightarrow /s/ \text{ / } X]_N$ [for X a member of $\{+ling, +ung, \dots\}$

This rule is correct, but very selective; in effect it only deals with morphologically complex (i.e. suffixed) N₁s. It does not account for any other input to -s- insertion in compounds, like e.g. feminine nouns etc. The second rule of consonant epenthesis that Wiese proposes concerns the so-called *Sproßkonsonanten* ('epenthetic consonants'), which will be discussed in IV.2.7 below.

I would like to postpone the formulation of unifying generalisations regarding *-s-* until after the analysis in IV.3, since rules I would be able to construct on the basis of the data discussed here would not capture generalisations based on productivity.

IV.2.2 *-(e)n-*

According to Fleischer (1974:127) *-(e)n-* occurs frequently after feminine nouns ending in *-e* (e.g. *Wiege, Katze*; exceptions: *Liebe-s...*, *Hilf-s...*); its origin is in the plural of weak nouns. Strong FEM. **not** in *-e*, and strong MASC. and NEUT. rarely have *-en-* in compounding. The following analysis will show that these predictions are in broad terms correct, but can be specified much more accurately - the results of which yield predictive power.

The linking element *-en-* can generally be found after nouns ending in a consonant or a vowel other than *-e* (*Narr-en-kappe, Pfau-en-auge*); *-n-* stands after nouns ending in *-e*, and some /ə/ syllables (e.g. *-er*): *Affe-n-bande, Vetter-n-wirtschaft*. Wiese (1996a:143) points out that very frequently, the *-(e)n-* linking element seems to be identical with the regular plural formations: *Blume-n-duft, Tasche-n-messer, Professor-en-versammlung, Motor-en-geräusch*. However, contradicting initial hypotheses from IV.2.1 regarding morphologically complex N₁ and *-s-* above, *-en-* can also follow certain morphologically complex N₁s, namely after the suffixes *-ent* (*Student-*), *-and* (*Konfirmand-*), *-ant* (*Konsonant-*), *-ist* (*Jurist-*), *-in* (*Studentin-*) and, in one exceptional case: *-ment* (*Instrument*). The latter is problematical for the approach taken here; for *Instrument -en-* is not a licensed linking element, because it does not occur in Nom. Sg., Gen. Sg. or Nom. Pl.⁴⁸, and therefore should not occur.

TABLE (C)

noun categories	<i>-n-</i> linking element	<i>-en-</i> linking element
MASCULINE		

⁴⁸ The fact that *Instrumenten* is the dative plural is my opinion accidental. Cf. below the discussion of *Schwanenhals, Hahnenfuß, Mondenschein*. See also Footnote 49.

I. -s, --	*	*
II. -s, -- (Umlaut)	*	*
III. -(e)s, -e	*	! <i>Greis-en-alter, Mond-en-schein, Stern-en-glanz</i> ⁴⁹
IV. -(e)s, -e (Umlaut)	*	! <i>Schwan-en-gesang</i>
V. -es, -er (Umlaut)	*	*
VI. -(e)n, -(e)n	<i>Zeuge-n-stand, Hase-n-futter, Bote-n-versammlung, Insasse-n-versicherung, Franzose-n-brot, Löwe-n-zahn</i>	<i>Mensch-en-kenner, Held-en-tat, Narr-en-kappe, Konsonant-en-tabelle, Bär-en-pfote, Präsident-en-suite</i>
VII. -(e)s, -(e)n	<i>See-n-platte, Vetter-n-wirtschaft</i>	<i>Staat-en-bund, Dorn-en-krone, Nerv-en-säge, Stahl-en-behandlung, Pfau-en-auge, Typ-en-bestimmung, Diktator-en-versammlung</i>
VIII. -(e)s, --	*	*
IX. -ns, -n	<i>Gedanke-n-freiheit, Gedanke-n-gut, Wille-n-losigkeit, Buchstabe-n-verschönerung</i>	*(because all examples end in /ə/)
X. -s, -s	*	*
FEMININE		
I. --, -- (Umlaut)	*	*
II. --, -e	*	*
III. --, -e (Umlaut)	*	*
IV. --, -(e)n	<i>Wiege-n-lied, Nase-n-bein, Katze-n-futter, Freude-n-tränen, Sardelle-n-paste, Kommode-n-schublade, Asche-n-puttel, Kirche-n-musik</i>	<i>Frau-en-arzt, Geburt-en-ziffer</i>
V. --, --	*	*
VI. --, -s	*	*
NEUTER		
I. -s, --	*	*
II. -(e)s, -e	*	! <i>Instrument-en-bauer</i> ⁵⁰
III. -es, -er (Umlaut)	*	*
IV. -(e)s, -(e)n	<i>Auge-n-arzt, Interesse-n-bereich</i>	<i>Ohr-en-schmerzen, Bett-en-laden</i>
V. -ens, -en	*	
VI. -s, -s	*	*

⁴⁹ I think these three examples can safely be put aside on the grounds that these forms are antiquated; the more archaic form *Mondenschein* e.g. is now gradually being replaced by *Mondschein*. The only other examples where a non-licensed linking element occurs are *Hahnenfuß*, *Schwanensee*, see MASC. IV.

⁵⁰ This is a lexical exception, not just because *-en-* is not licensed here (cf. Gen. Sg.: *des Intrumentes*, Nom. Pl. *die Intrumente*), but also because none of the other examples in *-ment* take *-en-*; they all take *-s-* cf. IV.3.13.

MASC.: *-(e)n-* is overall much more regular than *-(e)s-*. It is available only for those classes where *-(e)n* also features in the inflectional paradigm in the Nom Pl. Also, the issue of presence or absence of schwa is much more straightforward than in the *-(e)s-* cases; the alternation is here purely phonotactic, and does not signify a distinction between a linking element and an inflection. The few exceptions to the licensed *-(e)n-* insertion are in MASC. III. and IV. and appear to be lexical exceptions (cf. also e.g. *Hahnenfuß* ‘crowfoot’), originally possible left over from OHG Gen. Sg. *-in*.

MASC. VI.: the paradigm that has *-(e)n* in Gen. Sg. (*Grafensohn* ‘son of a count’) as well as in the Nom. Pl. (*Affenherde* ‘horde of monkeys’) seems to always and exclusively have *-(e)n-* as a linking element, and items from this paradigm **never occur without it**.

First possible rule for the insertion of *-(e)n-*:

If Gen. Sg. and Nom. Pl. are *-(e)n*, then the linking element will be exclusively *-(e)n-*. Neither the Nom. Sg. *-Ø-* nor the default *-s-* can apply.

The problem here lies within the fact that Gen. Sg. and Nom. Pl. are non-distinct, and that it is therefore difficult, and in some cases impossible to determine whether Gen. Sg. or Nom. Pl. interpretation is sought (cf. *Bärenhunger* ‘bear-like hunger’, *Heldentat* ‘heroic deed’). In some examples, the N_2 can determine number; *+bund*, *+versammlung* (*Präsidenten-*) require N_1 semantically to be plural⁵¹. It is for examples of this class that Wurzel (1970) first and foremost introduced the notion of stem-forming affixes. While the notion of ‘stem-forming’ affixes is very useful in solving the problem for schwa in $[[V_{\text{stem}} _] [N]]$ compounds, it does not contribute anything to the solution of $[[N] _ [N]]$ compounds and the issue of linking elements. On the other hand, with an approach that ties the linking elements to the inflectional class which N_1 appears in, *-(e)n-* can be proven to be a completely regular phenomenon: it is inserted as a linking element only where licensed and there are only a

⁵¹ Note that this could also be **genitive** plural.

handful of exceptions to this rule. As already indicated in IV.2.1, *-(e)n-* insertion will also have prominence over the insertion of the default link *-s-*.

MASC. VII.: in this class, the linking elements *-(e)s-* and *-(e)n-* are both licensed, but of the two, *-(e)n-* seems to be much more frequent. As indicated above (IV.2.1), this must be to do with the relative dominance of *-(e)n-* over *-(e)s-*, and the ordering of one rule above the other. However, in these examples there is no obvious link between the occurrence of the linking element *-(e)n-* and plural semantics; cf. *Staatenbund* ‘confederacy’ (plural), *Dornenkrone* ‘crown of thorns’ (plural), *Pfauenauge* ‘eye (in peacock feather)’ (singular).

MASC. IX.: only *-n-* (but not *-en-*) occurs (because all examples end in *-e*), not necessarily with plural semantics, though.

The FEM. classes are completely regular; only FEM. IV. has *-(e)n* in the paradigm, and thus is the only one licensing *-(e)n-* linking elements. In FEM. IV., *-(e)n-* is by far the most frequent linking element (compared to \emptyset which is also licensed, and *-s-* which is permissible by default); it is the only linking element which can actually occur with **all**⁵² examples from this class. *-(e)n-* however is **not** necessarily also linked to plural semantics; Wurzel (1970:26) quotes examples which show a semantic singular and a morphological plural, *Gallenschmerzen* ‘gall bladder complaint’, *Hurenbalg* ‘son of a bitch’, *Lindenbaum* ‘lime tree’. However, I think this indicates again the preference of *-(e)n-* over \emptyset -, provided *-(e)n-* is licensed.

NEUT.: NEUT. I, II, III. and VI. do not have *-(e)n* in the paradigm and therefore also no *-(e)n-* linking element. The only exception is *Instrumentenbauer* ‘instrument maker’ in NEUT. II., which is a lexical exception. NEUT. IV. is completely regular; it has *-(e)n* in the

⁵² With the exception of *Leber* and *Semmel*, which both end in schwa syllables. Even though this does not constitute blocking for *-n-* (cf. *Vetternwirtschaft*), as observed in IV.2.1 above, examples ending in ‘schwa syllables’ (or: ‘syllabic sonorants’) tend to prefer \emptyset - linking elements.

plural paradigm, and therefore also *-(e)n-* linking element. The fact that NEUT. V. should have *-en-* linking element, but does not does not weigh too severely; *Herz* is the only item in this class anyway, and as can be seen from many of the above examples, the membership of an item in a certain class makes it available for a number of **potential** linking elements. This however does not necessarily mean that the item will then automatically take these linking elements; it just means that it is more likely to do so.

Wiese (1996a:147) suggests that some of the examples that I labelled ‘exceptions’ above can be explained if they are interpreted as a different kind of inflectional affix: not Gen. Sg. or Nom. Pl., but dative plural. He argues that at least formally some of the linking elements resemble the dative plural; e.g. in *Stern-en-glanz* ‘starshine’, *Instrument-en-bauer* etc. Thus, Wiese cites *Hahn-en-fuß*⁵³ (1996a:147) as a potential dative plural, even though he does note the lack of umlaut. I disagree strongly with this interpretation of the facts. There is no functional or semantic motivation for drawing this conclusion, nor is the occurrence of the dative plural inflection in the juncture of nominal compounds in any way a ‘productive’ phenomenon. There are two main arguments against it; one, because if this were dative plural, it would require the umlaut as well as the *-en-* (Dat. Pl. *den Hähnen*)⁵⁴; secondly, the OHG form was *hanin-fuo3*, i.e. originally a genitive. It would therefore appear far more likely that the modern form is a descendant from the OHG genitive compound, with the full vowel reduced to /ə/ (cf. Wilmanns, 1896: 517). The difficulty with the current analysis is that I am attempting to account for a productive insertion of linking elements in compounds, and am therefore forced to label examples such as these as lexicalised exceptions. I would not wish to argue that speakers produce an OHG genitive ‘online’, but rather that the whole compound is listed.

⁵³ The nominative plurals are *Stern-e*, *Instrument-e*, *Hähn-e*.

⁵⁴ As will be shown in the subsequent analysis, if a linking element occurs that is identical with the plural affix, and the plural form of the item also involves umlaut (if available), then umlaut will also occur. Even though the semantics also suggest a singular interpretation of *Hahnenfuß*, it is the lack of umlaut here which indicates the improbability of a plural interpretation.

Similarly, *Schwan-en-hals* ‘swan neck’, *Schelm-en-streich* ‘trick’, *greis-en-haft* ‘senile’ can be seen as problematic for the analysis. Wilmanns (1896:528) suggests that here, originally weak masculines that have turned into strong masculines, but nevertheless retained the *-en*-linking element which was assigned at the point of compound creation, and subsequently became lexicalised. (Wilmanns, 1896(I):11) also argues that fossilised forms have been retained in *Marie-n-hospital* and *Sonne-n-schein*: the OHG Gen. Sg. of *Sonne*, ‘*sunna*’ is *sunnun* (Braune, 1955⁸:226), and the OHG Gen. Sg. of *Maria* is *Mariun* (Braune, 1955⁸:227). It is thus quite possible that what now appears to be an oddly inappropriate Nom. Pl. is quite simply a relic of an originally appropriate genitive.

On the deletion of /ə/ in *Aug-apfel* ‘apple of the eye’ vs. *Auge-n-lid* ‘eye lid’ see IV.2.7 below.

IV.2.3 *-(e)n-s-*

-(e)n-s- has been termed ‘Doppelfuge’ (‘double link’), and it occurs very infrequently. Wiese (1996a:147) interprets it as a regular nominative plural affix in conjunction with the linking element *-s-*. It could be allomorphy in some cases, or the analogical spread of the licensed application of the Gen. Sg. inflection of **two** classes (MASC. IX and NEUT. IV) to a few other, unrelated items.

The only inflection classes which have *-(e)ns* as the Gen. Sg. inflection are class MASC. IX. and NEUT. IV. Therefore, since *-(e)ns-* is licensed here, it is unsurprising to find examples such as *Name-ns-gebung*, *Name-ns-tag*, *Wille-ns-schwäche*, *Glaube-ns-bekenntnis* etc., and *Herz-en-s-freude*, *-lust*, *-kind*, *-brecher*. This analysis is much more obviously related to the facts than calling this linking element a ‘double juncture’, which it clearly is not. There are a few examples where *-(e)ns-* is not licensed: *Schmerz^{ens}geld*, *Schmerz^{ens}schrei* (but cf. *Schmerzmittel*), *Mensch^{ens}kinder*⁵⁵ and *Frau-en-s-person*, but they are very restricted and

⁵⁵ As an exclamation only; contrast *Menschenkind*.

cannot be applied productively: *Mensch* and *Frau* do not seem to take this linking element in conjunction with any other N₂.

A possible rule for the insertion of *-(e)ns-* as a linking element is therefore:

Insert *-(e)ns-* only where it is licensed. 3 lexical exceptions are listed.

IV.2.4 *-e-*

This linking element is found frequently after nouns, but also after verbs (cf. ch. III), where it is the only possible linking element which can occur. The two linking elements may be identical in appearance, but should not be confused; the *-e-* after verbs functions as a stem-forming element, which is predominantly phonetically conditioned. The *-e-* after nouns, however, is largely not phonetically conditioned, and shows strong links to the nominative plural inflection *-e*. It will be one of the aims of this chapter to show that it is actually identical to the Nom. Pl. inflection in form as well as function. I have found no evidence to substantiate claims that the *-e-* linking element between nominal compounds may also be phonologically determined. Fleischer (1974:128) suggests that *-e-* is suppressed after voiceless consonants (contra: *Städtebund*, *Getränkehalle*, *Gästezimmer* etc.), and that if a feminine noun has more than two syllables, it is most likely to be followed only by *-e-* (Fleischer, 1974:127) (contra: *Familie-n-feier*, *Fassade-n-kletterer*). Wiese (1996a:143) mentions that “all linking morphemes adding a schwa syllable create preferred prosodic structures, namely branching feet” - for which again there seems to be no evidence.

One of the main points to observe with respect to the *-e-* is that here, for the first time, is a linking element which is relatively productive and which cannot be mistaken for a Gen. Sg. inflection. That is, wherever *-e-* occurs, it will have to be motivated by its presence in the item's inflectional paradigm, and, since it is - formally at least - the plural inflection, ought to cause umlaut where umlaut is permitted.

TABLE (D)

noun categories	-e- linking element
MASCULINE	
I. -s, --	*
II. -s, -- (Umlaut)	*
III. -(e)s, -e	<i>Tagelöhner, Tagedieb, Hund-e-leben</i> (cf. pl)
IV. -(e)s, -e (Umlaut)	<i>Gäst-e-zimmer</i> (cf. pl)
V. -es, -er (Umlaut)	*
VI. -(e)n, -(e)n	*
VII. -(e)s, -(e)n	*
VIII. -(e)s, --	*
IX. -ns, -n	*
X. -s, -s	*
FEMININE	
I. --, -- (Umlaut)	*
II. --, -e	*!
III. --, -e (Umlaut)	<i>Gäns-e-leber, Händ-e-druck, Städt-e-planer</i>
IV. --, -(e)n	*
V. --, --	*
VI. --, -s	*
NEUTER	
I. -s, --	*
II. -(e)s, -e	<i>Getränk-e-steuer, Werk-e-verzeichnis, Pferd-e-fleisch,</i>
III. -es, -er (Umlaut)	*
IV. -(e)s, -en	*
V. -ens, -en	! <i>Herz-e-leid</i>
VI. -s, -s	*

MASC.: The -e- linking element only occurs in MASC. III. and IV., i.e. the only classes that also have -e in the paradigm. It therefore appears to be totally regular. In MASC. III. however, the -e- linking element is not necessarily coupled with plural semantics: -e- does not necessarily correspond with the meaning plural (*Hundeleben* ‘dog’s life’), and plural semantics do not have to marked by -e- (*Dolchsammlung* ‘dagger collection’).

As with MASC. I. and II, MASC. III. and IV. differ only in the fact that the Nom. Pl. in one class shows umlaut, while in the other class it doesn’t. This is here particularly important to

note, since it is this distinction between the Nom. Sg. and Nom. Pl. that leads to more scope in the interpretation of the linking element which ‘happens to look like the Nom. Pl. inflection’. Whenever *-e-* is used as a linking element in MASC.IV, co-occurring with it is umlaut. The most likely interpretation of this phenomenon is that the *-e-* is in fact the Nom. Pl. inflection; if the insertion of *-e-* were purely mechanical, the umlaut would not need to occur. This conclusion can be further backed up by the fact that wherever *-e-* occurs **with umlaut**, the interpretation of A in a compound AB is that of plural semantics: *Gästezimmer* ‘guest room’, *Ärztchamber* ‘medical association’.

FEM.: Since *-e* is the Nom. Pl. inflection in FEM.II. and III., we would expect to find the linking element there as well. However, it does not occur in FEM.II. It may be difficult to gain any kind of generalisation from this class, particularly since there are few examples, but one possible explanation for the absence of the licensed *-e-* may lie in the fact that all examples in FEM. II. end in a suffix (*-nis*), and thus are predisposed to the default linking element occurring after most suffixes, *-s-*. That *-s-*, in this class of examples here, does not occur either must be related to the items’ phonotactic make-up (they all end in /s/), rather than any morphological interpretation.

In FEM. III., however, *-e-* occurs quite frequently and regularly (i.e. it never occurs without umlaut, as specified in the Nom. Pl.). Again, this is evidence that *-e-* here does not merely fill the ‘juncture’ position between two nouns, but rather that it is nominative plural inflection.

NEUT.: The occurrence of *-e-* in NEUT. II. is regular and predictable; the linking element is licensed by the *-e* inflection of the Nom Pl. Note, however, that the occurrence of the linking element does not coincide with plural semantics being attributed. The form in NEUT. V. is dated and must therefore be regarded as a lexical exception.

Elsewhere, *-e-* is not licensed, and therefore does not occur.

IV.2.5 *-er-*

“Im Unterschied zu den übrigen Fugenelementen tritt [*-er-*] nur dann auf, wenn die erste Konstituente den Plural auf *-er* bildet. Aus diesem Grunde bestehen hier noch die stärksten Berührungen zwischen Fugenelement und Flexionszeichen.”⁵⁶ (Fleischer, 1974:130)

Like *-e-*, the linking element *-er-* is a regular plural inflection after masculine and neuter nouns; and like *-e-* above, it will occur in conjunction with umlaut if the stem permits it. Without exception, *-er-* only occurs after nouns for which it is also the correct (nominative) plural form. This may tie in with the semantics (i.e. that the actual meaning of plural is signalled by the attachment of the plural affix), but not necessarily: *Hühn-er-ei* ‘chicken egg’, *Ei-er-schale* ‘egg shell’ but cf. *Buch-handlung* ‘book shop’, *Bild-band* ‘picture book’; *Rind-fleisch* ‘beef’ vs. *Rind-er-braten* ‘roast beef’.

TABLE (E)

noun categories	<i>-er-</i> linking element
MASCULINE	
I. -s, --	*
II. -s, -- (Umlaut)	*
III. -(e)s, -e	*
IV. -(e)s, -e (Umlaut)	*
V. -es, -er (Umlaut)	(cf. pl:) <i>Geist-er-stunde, Männ-er-verein, Gött-er-speise</i>
VI. -(e)n, -(e)n	*
VII. -(e)s, -(e)n	*
VIII. -(e)s, --	*
IX. -ns, -n	*
X. -s, -s	*
FEMININE	
I. --, -- (Umlaut)	*
II. --, -e	*
III. --, -e (Umlaut)	*
IV. --, -(e)n	*

⁵⁶ ‘In contrast to the other linking elements, [*-er-*] only occurs if the first constituent forms the plural in *-er*. That is why it is here that the strongest contacts remain between linking elements and inflections.’ As indicated, other linking elements show the same connections to inflection, but this quotation is one of the few which notes the dependency, at least for *-er-*.

V. --, --	*
VI. --, -s	*
NEUTER	
I. -s, -- (Umlaut)	*
II. -(e)s, -e	*
III. -es, -er (Umlaut)	<i>Länd-er-spiel, Gespenst-er-suche, Lied-er-macher, Kleid-er-bügel, Kind-er-garten, Büchersammlung, Häus-er-meer, Bild-er-buch, Ei-er- kuchen (cf. Pl.)</i>
IV. -(e)s, -en	*
V. -ens, -en	*
VI. -s, -s	*

The linking element *-er-* can only occur in those categories that have *-er* as their nominative plural, namely MASC. V. and NEUT. III. *-er-* is **never** inserted after any other category, and it is therefore totally regular. It is of importance to the general argument that *-er-* as a linking element always causes umlaut if the noun has umlaut (as well as the *-er* inflection) in the Nom. Pl.; this proves that the *-er-* linking element can unambiguously be interpreted as plural inflection. Furthermore, if *-er-* (with or without) umlaut occurs in the juncture position of $[[N_1] _ [N_2]]$ compounds, the interpretation of N_1 is plural (cf. *-e-* above): *Geisterbahn* etc. (N.b. this argument does not hold if inverted, i.e. if no *-er-* link occurs, this does not necessarily mean that plural interpretation is impossible, cf. e.g. *Wurmsucher* or *suchlike*.)

It is interesting to note that the insertion of the linking element *-er-* in NEUT. III. again also triggers umlaut; i.e. yet again all the diagnostics for a potential plural interpretation are given, and not just one (e.g. inflection on its own). **Bucher-*, **Lammer-* or **Lander-* are not possible combinations.

IV.2.6 no linking element (-Ø-)

TABLE (E)

noun categories	no linking element
MASCULINE	
I. -s, --	<i>Knochenmark, Sommerpause, Ärmelschoner, Hobelbank, Schattenspende, Kuchenform</i>
II. -s, -- (Umlaut)	<i>Satteltasche, Gartenzwerg, Ladenhüter, Ackergaul</i>
III. -(e)s, -e	<i>Tagtraum, Fischfang</i>
IV. -(e)s, -e (Umlaut)	<i>Gastarbeiter, Gastfreund, Gastmahl, Arztpraxis, Traumdeuter</i>
V. -es, -er (Umlaut)	<i>Mannloch, Mundwerk, Leibschneiden, Waldfee</i>
VI. -(e)n, -(e)n	*
VII. -(e)s, -(e)n	<i>Muskelkater, Pantoffelheld, Stachelschwein</i>
VIII. -(e)s, --	<i>Hungerkünstler (V)</i>
IX. -ns, -n	*
X. -s, -s	<i>Akkusammler, Cocktailmixer, Fanclub, Parkverwalter</i>
FEMININE	
I. --, -- (Umlaut)	<i>Mutterschutz, Mutterkuchen, Mütterversammlung</i>
II. --, -e	<i>Erlaubniserteilung, Kenntnisnahme</i>
III. --, -e (Umlaut)	<i>Handstand, Stadtrat, Nachtwächter, Machtkampf, Saubude, Kraftaufwand</i>
IV. --, -(e)n	<i>Chronikschreiber, Leberfleck, Jagdwurst, Kirchhof, Liebediener, Bank-direktor</i>
V. --, --	<i>Gewährleistung</i>
VI. --, -s	<i>Lokführer, Barstuhl, Partystimmung</i>
NEUTER	
I. -s, -- (Umlaut)	<i>Kabelfernsehen, Kissenbezug, Klosterschenke, Gewebebank</i>
II. -(e)s, -e	<i>Gewichtheber, Gewehrlauf, Beinprothese, Meerjungfrau, Jahrmarkt</i>
III. -es, -er (Umlaut)	<i>Landhaus, Hausmeister, Wortschatz, Eigelb, Lammkeule, Buchladen, Kindfrau</i>
IV. -(e)s, -en	no ex.
V. -ens, -en	<i>Herzmassage, Herzklarin</i>
VI. -s, -s	<i>Porträtmaler, Hotelbesitzer, Wracksucher</i>

MASC.I.: The linking elements that are licensed in this class are -s- and -Ø-. However, -Ø- seems to be by far the preferred option. This observation applies with equal strength to MASC.II. This is of interest in particular because the examples in MASC.II. offer the potential distinction of Nom. Sg. and Nom. Pl. through umlaut, i.e. even if the linking element were invisible, the occurrence of umlaut would give some kind of indication of whether the first form was plural or not. However, this does not seem to occur at all - not even in cases where a plural interpretation is clearly sought, e.g. *Apfelkuchen*. As with many other examples of this kind, the semantics here suggests a 'generic interpretation', rather than 'singular', which would render the concept 'number' irrelevant. An *Apfelkuchen* is technically made out of more than one apple, or *Vogelhäuschen*⁵⁷ is generally visited by more than one bird. Generically, though, both describe a 'kind of N₂'. In both classes, not having a linking element seems to be by far the preferred option. With regard to examples in NEUT.I. this is quite striking, because there, as here, all (morphologically simplex) examples end in a /ə/ syllable. This appears to cause a severe restriction (n.b. but not a complete block, cf. *Handelsabkommen*) on the occurrence of -s- in these paradigms. Comparing this to other examples which end in schwa syllables, but belong to other inflectional classes, similarly prohibitive circumstances can be observed, cf. **Semmelknödeln* in IV.2.2 above.

MASC.III: -Ø- is licensed and therefore possible, but it may not be quite as frequent as what seems to be the most preferred options in this class: -s-. However, as will be shown in the analysis below, this generalisation will change quite dramatically when productive compound formations are being taken into consideration - as opposed to lexicalised forms.

⁵⁷ Depending on the direction from which one approaches this particular problem, it can be argued that some kind of blocking effect is in place here. In *Vogelhäuschen* the A element would be interpreted as a verb stem rather than a noun stem; therefore, if noun interpretation was sought, the umlaut must be blocked. It seems more likely, however, that the umlaut is not used for other reasons - considering all other examples in this class. For a more detailed discussion on this issue, see chapter III and IV.3.15.

MASC. IV: -Ø- is licensed, and one of the preferred options. The umlaut here is linked to the plural affix -e, so only occurs when the plural affix is used as a linking element.

MASC. V.: -Ø- is licensed, and the main option for many monosyllabic (and Germanic) nouns, with the exception of complex items, such as e.g. *Irrtum* and *Reichtum*.

MASC. VI.: This is the paradigm that has -(e)n in both Gen. Sg. and Nom. Pl. The only available linking element in this paradigm is therefore -(e)n-, since -Ø- is overruled by -(e)n-, and none of the others are licensed. The default -s- is blocked by the existence of a competing Gen. Sg. inflection that is **not** Ø. Nouns from this class **always** occur with a linking element after N₁ in [[N₁] _ [N₂]] compounds, and the only available linking element is -(e)n-. -Ø- could here be blocked for various reasons: (1) In terms of rule application it means that -(e)n- is applied before the more common -Ø-, which is licensed for all classes, subsequently blocking the application of any later rules. Or: (2) Based on a combination of stress and word-final /ə/, the insertion of a linking element that is not -Ø- becomes obligatory. – Similar arguments may account for the lack of -Ø- in MASC. IX, where -ns and -n respectively are the licensed linking elements; but see FEM. IV below, however, which has -(e)n in the Nom. Pl., but still allows for -Ø-.

MASC. VII.: -Ø- is licensed and occurs mainly after items which end in -el. In these cases however, no linking element can ever occur. The A forms in *Strahlrichtung* ‘direction of a beam / shining’, *Strahlkraft* ‘power of a beam / shining’ etc. could also be interpreted as verb stems; however, if nominal interpretation were crucial, the Nom. Pl. inflection would unambiguously turn them into nouns: *Strahlenrichtung*, *Strahlenkraft*.

MASC. VIII.: Ø is licensed, but only occurs with one of the examples. There are, however, only two examples, so this might not mean very much at all. Again, the probability that

Hunger- would be interpreted as a verb is quite high; but since there is no plural possibility for either form, the Gen. Sg. inflection would here be the only alternative, cf. *Hungersnot*.

MASC. IX.: -Ø- is licensed but never occurs. One of the reasons for this could be phonotactic; /ə/ tends to be followed by linking elements (unless, of course, it **is** the linking element). However, the reasoning from MASC. VI. above (this section) can apply (both ways!): -Ø- could be blocked here because the licensed linking elements that are applying are *-ns* and *-n*, so that -Ø- is blocked somehow. Again, the fact that both linking elements contain /n/, may give them a higher status than either the default element or the licensed -Ø-.

MASC. X.: In this group, no linking elements are licensed in the paradigm, except for *-s-* and -Ø-. *-s-*, however, is blocked by its appearance in the Nom. Pl. (see IV.2.1 above). As a result, -Ø- is the only possible option for items in this class.

FEM. I.: -Ø- is licensed by the paradigm, with or without umlaut.

FEM. II.: -Ø- is licensed by the paradigm, and is furthermore the only occurring option for this class (examples in *-nis*).

FEM. III.: -Ø- is licensed, and occurs (mainly with native, monosyllabic vocabulary). Interestingly, this is exactly the group of examples within FEM. III. in which the default *-s-* is prevented from application. Again, this strengthens the argument of ordered rule application; if the licensed linking elements are inserted, the defaults are blocked.

FEM. IV.: -Ø- is licensed. It does not occur after complex items which take *-s-*, though, cf. IV.2.1. Complex forms (with a few exceptions, cf. IV.3.13 below) seems to take *-s-* as their one and only linking element, and all other linking elements can never apply, irrespective of

whether or not they are licensed or even the other possible default, -Ø-. Furthermore, -Ø- does not occur after /ə/ (or other vowels), unless the vowel is deleted, cf. *Kirchhof* ‘churchyard’, *Kirchgänger* ‘church goer’, *Kirchspiel* ‘parish’, which seems to happen quite rarely, see below (this section).

FEM. V.: -Ø- is licensed (Nom. and Gen. Sg.). However, it does not apply after the complex *Gesundheit* (cf. IV.3.13).

FEM. VI. Since -s- is blocked (cf. Nom. Pl.), -Ø- (licensed Nom. and Gen. Sg.) is the only available options for items from this class.

NEUT. I.: -Ø- is licensed (Nom. Pl.) and occurs - more frequently than -s- does (which is also licensed (Gen. Sg.)). This group shows a large number of similarities to both MASC. I. and II.; in IV.3.1.a - c they will be analysed comparatively.

NEUT. II.: -Ø- is licensed, and occurs, sometimes in examples which never take a linking element, e.g. *Bein-*, *Gewehr-*, but also in some instances where -Ø- alternates with -es- (*Jahrmarkt* ‘fair’ vs. *Jahreseinkommen* ‘annual salary’, *Jahreswechsel* ‘New Year’; *Meerkatze* ‘long-tailed monkey’ vs. *Meeresgrund* ‘bottom of the sea’) or with -s- (*Gewichtheber* ‘weight lifter’ vs. *Gewichtsklasse* ‘weight class’).

NEUT. III.: -Ø- is licensed and occurs. In some cases -Ø- is the alternative option (cf. *Kindfrau*, *Kindbett* vs. *Kinderwagen*, *Kindskopf*, *Kindesmißhandlung*). Again, the items from this class that can occur without linking element are native monosyllabic forms.

NEUT. IV.: -Ø- is licensed, and does not seem to occur. (This, as will be shown in IV.3, is quite wrong when productivity is taken into account.)

NEUT. V.: -Ø- is licensed and in evidence; the only example in this group, however, is *Herz*; and large-scale generalisations based on one example are questionable. Otherwise the fact that both licensed linking elements contain /n/, and -Ø- is still possible, would have to be regarded as counter-evidence to the above argumentation.

NEUT. VI.: -Ø- is the only available option since no other linking elements are licensed, and -s- is banned from application because of the presence of -s in the Nom. Pl.

Most of the examples above from all different inflectional paradigms can occur **without** linking morpheme. However, there are some items which prefer to be without link, and there are others which always take one (e.g. MASC. VI. takes -(e)n-, always and exclusively). For example, a linking element is required after e.g. those suffixes that will be examined in IV.3.13 below, all of these have -s- in the juncture position: -ung, -heit, -keit, -schaft, -sal, -tum, -ling etc.

There are numerous cases where no linking element occurs in the juncture position between [[N] _ [N]] compounds; i.e. those examples which Wilmanns (1896) would have originally classed as ‘true’ compounds. It is interesting to observe that the majority of these show formally Nom. Sg. (or, less frequently, where it is -Ø, Nom. Pl. or Gen. Sg.) in the first element (i.e. no inflection), while the semantics may point towards a ‘plural’ (or at least a ‘generic’, i.e. in the sense of ‘for/of all things of this kind’) interpretation; e.g. *Schaf-stall* ‘sheep shed’, *Auto-händler* ‘car salesman’, *Buch-handlung* ‘book shop’, *Zahn-pasta* ‘tooth paste’, *Vogel-futter* ‘bird feed’ etc. Wilmanns (1896:524) had suggested that this is in fact **not** the Nom. Sg. inflection, but rather ‘true’ compounding whereby the first element is the stem of the noun - which crucially does **not reflect case or number**. Analysing these examples in this way makes a semantically generic interpretation both possible and likely.

This is in contrast to the ‘untrue’ compounds (i.e. those which have linking elements), which exhibit case as well as number. Even though it appears to be overall more frequent to find a formal plural affix whenever the semantics are definitely plural, there are still sufficiently many cases which lack this explicit marking. It may well be that this condition follows from whatever regular plural the item has; cf. *Löffel*, *Engel* etc. without linking element; furthermore cf. *Väter-*, *Gräben-?!*, *Böden-?!...* i.e. those that form plural via umlaut only.

Lastly, the rare phenomenon of deletion⁵⁸ needs to be mentioned. There are a number of examples where the word-final /ə/ is deleted if the item enters a compound: *Strafvollzug*, *Hetzjagd*, *Münzfernsprecher*, *Grenztruppen*, *Lokomotivführer*, *Wettbüro*, (from Fleischer, 1974:128). Further:

Schul-kind, *Schul-tasche*, *Schul-uniform*, *Schul-heft*, *Schul-politik* etc. **Schulen-*
Kirch-hof, *Kirch-gänger*, *Kirch-turm* etc. vs. *Kirchentag*, *Kirchenbann*, *Kirchenchor* etc.
Kron-leuchter, *Kron-prinz*, *Kron-zeuge* vs. *Kronenkorken*, *Kronentaler* etc.
Mühl-bach, *Mühlwerk*; *Mühl(en)rad*, *Mühl(en)stein*
Reb-stock, *Reb-laus*, *Reb-schmit*, *Reb-bau* etc. vs. *Rebenblüte*, *Rebenveredelung* etc.
Nas-horn vs. *Nasenbein*
Hilf-reich (cf. also *Hilfsmittel*, *Hilfswerk* etc.; *Hilfeleistung*, *Hilfestellung* etc.)
Aug-apfel vs. *Augenlid* (NEUT!)

All examples are from the class FEM. IV., with the exception of *Auge* which is NEUT. It is possible to see this as additional evidence for the fact that the schwa is **not** uniformly deleted when a noun which ends in schwa enters compounding; the noticable exception is the rather large group of MASC. VI (*Affe*, *Löwe* etc.) which never lose the schwa in compounding.

As has been discussed in I.3 and IV.1.3 above, there are two possible ways to interpret this range of data: (a) This is ‘stem’ compounding. The noun stems enter into compounding prior

⁵⁸ Recall that I consider the noun-final schwa to be part of the root, and not an affix; hence ‘deletion’.

to the attachment of the noun-forming suffix *-e*. I have dealt with this issue in chapter I (1.3), where I give evidence why *-e* cannot be interpreted as a noun-forming suffix, and where it is argued that there is no such thing as a visible noun stem in German. (b) Instead of an insertion of one of the available linking elements, the final schwa of these nouns is deleted. Some of the examples are very obviously listed exceptions (e.g. *Nashorn* ‘rhinoceros’), others show alterations between more archaic (the schwa-less ones) and more modern (with schwa and plural inflection) sounding variants; some, however, seem very productive (*Schul-* in particular), but possibly ‘only’ because of analogy. I have no explanation for this (but see IV.3.11 below) beyond the suggestion that all examples which behave in this way require listing on stratum I.

IV.2.7 *-t-*, intrusive stops and *-o-*

This section is added merely for completeness’ sake; the examples discussed here are not ‘linking elements’ in the sense they were defined above (in the case of *-t-* and intrusion) and none are not inserted in the environment $[[N] _ [N]]$. Nevertheless, they are often mentioned in discussions of linking elements in compounds (e.g. Wilmanns (1896 (I):137) has a section on why the /t/ cannot be derived from the present participle), and Wiese (1996a:232) has a special insertion rule for intrusive stops.

Examples: *gelegen-t-lich*, *öff-en-t-lich*, *namen-t-lich*, *orden-t-lich*, *wöchen-t-lich*; *eigen-t-lich*, *flehen-t-lich*, *hoff-en-t-lich*, *wesen-t-lich*, *wissen-t-lich*.

-d-: *eilen-d-s*, *durchgehen-d-s*, *zusehen-d-s*, *stillschweigen-d-s*, *vollen-d-s*.

The diverse nature of the bases leads Wilmanns (1896 (I):138) to compare the above phenomenon to that of so-called ‘Sproßkonsonanten’ (‘epenthetic consonants’), which are a purely phonological phenomenon. They are never visible in modern German spelling, even though there is evidence for the existence of these insertions from Luther’s writings (cited in

Wilmanns (1896:138): *allesampt, berumpt, ungereimbt, verdampfen, frembdling, wundsch, wünschen, Amptknecht*. (Cf. also Paul, 1920:12)⁵⁹

List of ‘Sproßkonsonanten’ (Wiese, 1996a:233):

Gans, Mensch n t s, n t ʃ but: *Vers, Marsch* r __ s, r __ ʃ
Hals, falsch l t s, l t ʃ
Wams, Ramsch m p s, m p ʃ
Balkons ŋ k s

The phenomenon of intrusive stops may serve to explain examples of the type *wesentlich* above, but does not have any relevance for the description of linking elements. A comparison between e.g. the linking element *-s-* and intrusive stops serves to highlight the complex nature of the former. The linking elements in compounds have their origin undoubtedly in inflection (in fact, with the exception of *-s-*, they still are inflection) while intrusive stops are ‘sprouting’ from the phonology and have nothing whatever to do with morphological considerations.

Wiese (1996a:232) formulates a rule of consonant epenthesis:

$\emptyset \rightarrow /t/ \quad / \quad \dots /n/ \quad ___ [X \quad \text{for } X \text{ a member of } \{+lich, wegen, halben\}$

Even though he also stresses the fact that this insertion is fundamentally different from that of linking elements, the rule is of exactly the same nature as the one he proposed for the linking element *-s-*; it rather arbitrarily defines a set of suffixes before which the consonant is to be inserted. As the generalisations in IV.3 below will show, the environment for insertion of linking elements can be defined more accurately than by mere listing.

The linking element *-o-* is also not discussed here, based on the fact that it is predominantly found in non-Germanic vocabulary, and that it could not, under any circumstances, be confused with an inflectional affix. Examples which are formed with what is very likely a

⁵⁹ cf. English *bramble, dempster* etc.

‘true’ linking element (in that it is inserted after a root to facilitate compounding without any semantic consequences) behave in a significantly different way to the data discussed above: *Chem-o-therapie* ‘chemo-therapy’, *Elektr-o-technik* ‘electro-technic’, *Ital-o-western* ‘spaghetti western’, *Sad-o-masochismus* ‘somasochism’ etc. Duden (1995:486) observes that in most formations of this kind, the adjectival ending - *isch* has been replaced by -*o*; in the approach pursued here, the -*o*- would be inserted in the environment [[Root] _ [Root]]. It appears to me that the lexical status of the non-head element is not of crucial importance in these formations.

IV.2.8 Conclusion of analysis (1)

The main problem with conducting the analysis in a direction that takes the linking elements as a starting point lies in the fact that the various linking elements do not behave in a uniform fashion. As the analysis has shown, there are some linking elements which are ‘regular’ and predictable in their application; -*er*-, for example, only ever occurs in classes where it is licensed in the Nom. Pl., and is unmistakably the Nom. Pl. morpheme (see discussion of co-occurring umlaut in IV.2.5 above). However, generalisations about the most problematic linking elements, -*s*- in particular, are not readily available in such an approach. The other difficulty with analysis (1) is that the data here consists of lexicalised (i.e. fixed) compounds, some of which are traceable back to Old High German - including their linking elements (e.g. *Schwanengesang*, *Hahnenfuß* etc.). As with examples in chapter III, where e.g. *Hebamme* simply required listing as a lexical exception, many items here also show a certain degree of ‘fossilisation’, and the truly productive regularities cannot be observed. This is why I found it necessary to add the following section (analysis (2)) to highlight and account for the productivity of linking element insertion in compounds.

However, some broad generalisations can be made at this point. Throughout the analysis, and particularly in the discussions of the regular plural affixes -*er*-, -*e*-, and to some extent

also *-en-*, the validity of semantic arguments has been questioned. There does not seem to be any semantic necessity to distinguish between regular plural affixes which mean plural: *Kind-er-garten*, *Mütter-genesungswerk*, plural affixes which refer to A generically *Kind-er-wagen*, *Schwein-e-braten* and lacking plural affixes which also refer to A generically, cf. *Buchhändler*, *Autosalon*. With regard to lexicalised compounds, I have been unable to determine why it should be *Kinderwagen* and *Kindfrau*, and I do not find semantic considerations helpful in this respect. Cf. also Marchand (1969:124) on “copulative combinations” of the type *gentleman farmer*, *queen mother* etc.

An inflectional class X of nouns has inflectional affixes in both Gen. Sg. and Nom. Pl. (even if these are \emptyset). These inflectional affixes (which differ for all classes), and the *-Ø-* affix in the Nom. Sg. are what I have called the ‘licensed’ linking elements. This means that a noun N_1 which belongs to class X will have three linking elements automatically licensed, namely its Nom. Sg., Gen. Sg. and Nom. Pl. inflectional ending. In addition to that, the linking element *-s-* is what I have called ‘default’ linking element. If a noun N_1 enters into compounding in first position, the question of whether or not it may take a linking element will arise. To find out which one(s) it can take, a number of rules are required, which need to be ordered.

As the analysis has shown, it is only licensed linking elements that can occur for any item (with the exception of *-s-*), for example *Kinder-* and *Kindes-* are both possible formations, while *Kinde-* and *Kinden-* are not.

The default linking element *-s-* does not require licensing in the paradigm of the word; cf. *Versicherung-s-vertreter* etc. This phenomenon is particularly obvious in the feminine paradigm, where *-s-* occurs frequently but is never licensed. The application of the default linking element is restricted, however, by that of any competing licensed ones, which apply

first; in most cases, a competing licensed linking element has the ability to block the default. This means that all examples are in the first instance checked for insertion of licensed linking elements, and only then is the default considered (unless it is blocked, e.g. by *-s_{Pl}*).

-en- was shown to be a particularly ‘strong’ licensed linking element, which does not allow for other candidates to apply: all examples from the class MASC. VI., for example, which have *-(e)n* as inflectional affix in both the Gen. Sg. and the Nom. Pl. will only ever occur with *-(e)n-* as the linking element. There are also a few lexical exceptions where one of the regular linking elements applies unlicensed, cf. *Stern-en-glanz*, *Instrument-en-bauer*. There is only a handful of instances like these, and they require listing on stratum I.

Possible Rule (1): Insert licensed linking element

Sub-rules (a): there are ‘stronger’ and ‘weaker’ licensed linking elements. The Nom. Pl. inflection, and *-en-* in particular, is very strong. Where the Nom. Pl. is *-en* or *-er*, these licensed linking elements will apply more readily than the ones licensed by Gen. Sg., or the default option. It seems to be relevant whether Nom. Pl. or Gen. Sg. are doing the licensing.

(b): there are also instances in which linking elements are licensed, but never occur. This concerns mainly Gen. Sg. ones, but Nom. Pl. in *-e* is also affected. Cf. also a discussion of possible homophonous verb stems in IV.3.15 below; ‘Schwa in the juncture position is blocked if it results in competition with a homophonous verb.’

Possible Rule (2): Insert default linking element

Sub-rule (a): there are cases in which the default *-s-* is blocked by phonotactics/syllable shape etc.; for example after most examples which end in /ə/ or /ə/ syllables.

(b) there are cases in which the default linking element may never occur; in some instances because their application is blocked by a particularly strong licensed one. Another case of default blocking is the presence of *-s* in the Nom. Pl.. Therefore:

(c) if -s- is among the **licensed** linking elements, special rules apply. E.g.

- The linking element -s- **cannot** apply (not even by default) when it is licensed by virtue of its presence in the Nom. Pl. The presence of -s- in the Nom. Pl. inflection of any class causes an immediate ban of -s- as a linking element for this class.
- -s- **must** apply e.g. after morphologically complex items, cf. the discussion of these in IV.3.13 and IV.3.14. They almost always have -s- as a linking element, and no other linking element can compete.

The rules will be ordered on all three strata:

STRATUM I (ROOTS) LISTING	- lists exceptional compounds with their linking elements - lists exceptional plural formation - formation of verb stems
STRATUM II (STEMS) STEM COMPOUNDING	- regular inflection of nouns - [[Verb stem + /ə/] [Noun]] compounding - [[Noun + regular inflection] [Noun]] compounding
STRATUM III (WORDS) WORD COMPOUNDING	- [[Noun + default linking element] [Noun]] compounding

IV.3 Analysis (2)

As already indicated in IV.2.8, a second analysis is necessary at this point to achieve generalisations that capture the aspect of productivity. The above approach faced the task of attempting to account for already existing, established linking elements in their $[[N] _ [N]]$ environments, with varying results. Indeed, the results of the first analysis are somewhat questionable in light of the fact that the data consisted predominantly of lexicalised (sometimes 'fossilised') forms which are no longer in line with current productivity patterns. The results of analysis (1) can only really be called descriptive generalisations. However, analysing existing forms only covers one half of the phenomenon of linking elements; the much more intriguing part of the study is the one where the ongoing productivity can be accounted for. Here, I will look at what is essentially a similar stock of N_1 data ('A' in a compound AB), this time in compounding with new N_2 ('B' in a compound AB) forms. I have tried to keep nonce-formations to a minimum, but wanted to ensure that all compounds here are new, and produced 'on-line'. The process of collecting the data which is under investigation here is explained in more detail in III.1.1.

The B forms are chosen from different categories:

- (1) *-verkäufer* 'seller', *-sammler* 'collector', *-bauer* 'builder, maker' (forcing A to be a noun, with an accusative interpretation)
- (2) *-bund* 'alliance, union', *-genossenschaft* 'association' (forcing A to be a noun, with genitive plural semantics)
- (3) *-ersatz* 'replacement' (A is a noun with nominative semantics)
- (4) *-zimmer* 'room', *-frage* 'question', *-amt* 'office, department', *-spiel* 'game' (A can be either noun or verb-stem⁶⁰; if it is nominal, then with nominative semantics)
- (5) *-abend* 'evening', *-drang* 'urge', *-fimmel* 'craze' (suggesting that A is more likely to be a verb than a noun, if this interpretation is possible)

⁶⁰ This is particularly interesting in cases where a homophonous verb is available.

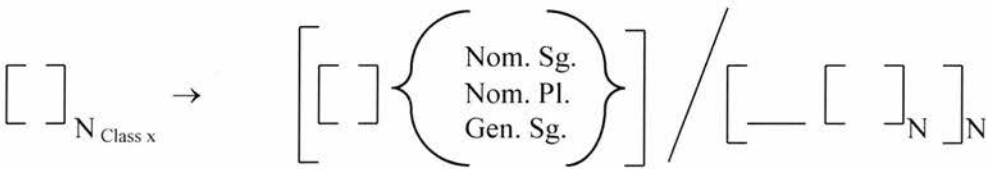
It will be interesting to observe just how big a part semantics plays in the choice of linking elements, and furthermore, if the semantics will always necessarily trigger the formal marker. That is to say if N₁ requires plural (or genitive) interpretation, will the linking element be identical with the plural (or genitive) inflection? If it is not, what is the alternative?

In the following section I will look at each inflectional class in turn, noting which linking elements are ‘licensed’ by the paradigm, and which of the ‘licensed’ ones actually occur productively. The definition of ‘licensing’ from IV.2 applies: the linking elements that can occur for any item are first and foremost the ones that must be present in the item’s Nom. Sg., Nom. Pl. or Gen. Sg. inflection; I propose to treat this as the ‘regular’ case. Default application of -s- is expected to play a more dominant role in this analysis, if the diachronic observation that linking elements started life as inflections and are now mutating into non-morphological material is to be upheld. Where I found the productive rules to be the same, I have conflated some of the inflectional classes from analysis (1) above. The productive rules or generalisations for the insertion of linking elements are stated at the end of each section. They will take the following format:

(1) Listed Exceptions (Stratum 1)

Stratum I contains a clipboard which can store complex items as simplex forms (cf. I.5 and V.4); all forms which are exceptional and very obviously not rule-governed may be listed here.

(2) Insertion of inflection (Stratum 2) (= insertion of licensed linking elements)



Stratum II is the location of the insertion of regular inflection, which of course includes the insertion of Nom. Pl. and Gen. Sg. inflectional affixes. As has been pointed out above, these inflectional affixes are identical with the linking elements which occur in [[N] [N]]

compounds; the insertion of the so-called licensed linking elements within nominal compounds is therefore also sited on this stratum.

(3) Insertion of the default linking element (Stratum 3)

$$\left[\begin{array}{c} \boxed{} \\ \boxed{} \end{array} \right]_{N \text{ Class } x} \rightarrow \left[\begin{array}{c} \boxed{} \\ \boxed{} \end{array} s \right] / \left[\begin{array}{c} \boxed{} \\ \boxed{} \end{array} \right]_{N} \left[\begin{array}{c} \boxed{} \\ \boxed{} \end{array} \right]_{N}$$

Stratum III is the location for the insertion of the unlicensed default linking element -s-. This default linking element will only be inserted where its application is not blocked by the insertion of a licensed linking element on stratum II, or by the specific blocking which is caused by the presence of -s in the Nom. Pl. inflection.

The rules (1), (2) and (3) are ordered. Thus, (3) e.g. only applies to items that have remained unaffected by either (1) or (2).

Based on observations from the previous analysis, it appears more appropriate to assume the actual point of insertion to be directly after the first noun: $[[N \text{ } ___] [N]]$, rather than in what has been called the ‘juncture’ position between the two elements, $[[N] \text{ } ___] [N]]$. The following analysis and its conclusion will bear this out.

IV.3.1.a MASC. I. Gen. Sg.: -s, Nom. Pl.: --

examples: *Lehrer, Himmel, Onkel, Sessel, Strudel, Tunnel, Balken, Sommer, Schatten, Knochen, Kuchen, Koffer, Ärmel, Besen, Käfer, Schwimmer, Frieden, Haken, Daumen, Adler, Ballen, Wagen, Groschen, Posten, Gaumen, Bagger, Dampfer, Bügel, Deckel, Esel, Flügel, Felsen, Rücken, Streifen, Fehler, Keller, Körper*;
 morphologically complex: *Verfahren*;
 homophonous verb available: *Braten*; (+ -n): *Tadel, Hobel, Donner, Anker*.

linking elements, licensed by the paradigm: Nom. Sg. licenses -Ø-, Gen. Sg. licenses -s-, Nom. Pl. licenses -Ø-.

Nb.: All examples are disyllabic and end in a ‘schwa syllable’ (more precisely: a syllabic sonorant): the second syllable is /əɪ/, /ən/ or /ər/.

Knochenzimmer, Knochenersatz ‘bone-’
Hobelzimmer, Hobelabend (both verb-stems), *Hobelverkäufer* (noun) ‘plane-’
Kuchenfrage, Kuchenamt, Kuchenabend ‘cake-’
Sesselverkäufer, Sesselerersatz ‘seat-’

Besenverkäufer, Besenbauer ‘broom-’

Bratenersatz, Bratenverkäufer (both A elements are nouns; verb interpretation would require verb stem input: *Brat-fimmel, Brat-drang* or even *Bratedrang*.) ‘roast-’

Friedenszimmer, Friedensfrage analogous to *Friedenspfeife, Friedensstifter* ‘peace-’

Himmelszelt, Himmelskraft ‘sky-, heaven-’

Nominative singular and nominative plural are non-distinct. The -Ø- linking element is the only possible option for items from this class. Lexical exceptions are *Frieden* and *Himmel*, where existing lexicalised compounds with -s- determine by analogy the insertion of -s- in new formations. The question of potentially homophonous verbs does not influence the choice of linking elements: *Hobelzimmer* is more likely to be [[Vstem] [N]] than [[N] [N]], but this class offers no possibility to distinguish the two. The B element -*abend* cannot force verb-stem interpretations of A elements that have no corresponding verb (cf. *Kuchenabend*). No unlicensed linking elements occur, not even in the lexical exceptions; this is possibly because the default linking element is identical with one of the licensed linking elements.

Rule for MASC. I.:

(1) Listed Exceptions (Stratum 1): *Friedens-*, *Himmels-* ... (analogy-driven, presumably originally Gen. Sg., but since these instances are not productive, this seems irrelevant)

(2) Insertion of inflection:

$$\left[\right]_{N_{\text{Masc I}}} \rightarrow \left[\left[\right] \left\{ \begin{array}{c} \text{Nom. Sg.} \\ \text{Nom. Pl.} \end{array} \right\} \right] / \left[_ \left[\right]_{N} \right]_{N}$$

$$= [N]_{\text{MASC.I.}} \rightarrow [[N] \emptyset] / [_ [N]]$$

(3) The default rule does not apply. (Stratum 3)

The licensed Gen. Sg. *-s-* does not occur in this class; Nom. Pl. licensing overrides Gen. Sg. licensing completely. For the final rules see IV.3.1.c below where MASC. I., MASC. II and NEUT. I. will be conflated.

IV.3.1.b MASC II. Gen. Sg.: *-s*, Nom. Pl.: *--* (Umlaut)⁶¹

examples: *Bruder, Apfel, Garten, Hafen, Laden, Ofen, Mantel, Schnabel, Faden, Kasten, Boden, Vater.*

homophonous verb available (+ *-n*): *Handel, Nagel, Sattel, Acker; Hammer, Vogel* (+ umlaut); homophonous verb: *Graben, Schaden.*

linking elements, licensed by the paradigm: Nom. Sg. licenses *-Ø-*, Gen. Sg. licenses *-s-*, Nom. Pl. licenses *-Ø-*.

Nb.: Again, all examples in this class are disyllabic; the second syllable is /əl/, /ən/ or /ər/.

Gartenamt, Gartenfrage, Gartenabend ‘garden-’

Apfellersatz, Apfelverkäufer ‘apple-’

Ofenzimmer, Ofenbauer ‘oven-’

Sattelverkäufer, Sattlersatz ‘saddle-’

Vogelverkäufer (*Vögelverkäufer* is not quite as good, but possible; misinterpretation as verb is impossible because of the semantics of *Verkäufer*) *Vogelzimmer* (where umlaut is blocked provided a noun interpretation is sought) ‘bird-’

Grabenfrage always interpreted as noun; cf. ch.III: the infinitive is rare as the first part of a compound. If verb interpretation was sought: *Grabefimmel*) ‘trench-’

Handelsamt, Handelszimmer analogous to: *Handelsgesellschaft, Handelskammer*
vs. *Handelabend* (verb semantics) ‘trade-’

Comparing the data in MASC. I. and II., two points are noteworthy. One, even though in MASC. II. the Nom. Pl. is distinct from the Nom. Sg. because of umlaut, this variation only seems to occur very rarely (e.g. *Brüdertreffen*) - and frequently not even in cases where a plural interpretation is sought (*Apfelverkäufer* selling more than one apple, *Ofenbauer* building more than one oven.) Two, in both classes, not having a linking element at all seems to be preferred to having *-s-*. This is an interesting observation, particularly with regard to examples in II.17 (NEUT. I.) where all items ending in a /ə/-syllable do not seem to take linking elements either. It is not an exclusive ban (cf. *Handelsgesellschaft*) though;

⁶¹ I initially chose to keep classes MASC. I. and II. apart, since Nom. Sg. and Nom. Pl. are nondistinct in one, but can be kept apart because of the umlaut in the other class. They will be conflated in IV.3.1.c

however, as with *Himmel* in MASC.I., I would interpret this as a lexical exception⁶². As I noted in IV.2, the reason I originally decided to separate out the classes was so that any variation at all would become visible immediately. Since in this case there is no distinction (even though there could have been one), the two classes can be conflated again.

MASC.I. and MASC.II. are, however also conflated with NEUT.I.

IV.3.1.c NEUT. I. Gen. Sg.: -s, Nom. Pl.: --

examples: *Fenster, Märchen, Becken, Eisen, Wesen, Kissen, Messer, Siegel, Kabel, Übel, Mittel, Wappen, Mädchen, Engelchen, Häuschen, Brunnlein, Bächlein, Gewebe, Gewissen* (no umlaut); *Kloster, Wachstum, Heldentum* (with Umlaut).

homophonous verb: *Leben*; (+ -n): *Schnitzel, Pendel, Lager, Segel, Wunder, Rätsel; Zeichen*

linking elements, licensed by the paradigm: Nom. Sg. licenses -Ø-, Gen. Sg. licenses -s-, Nom. Pl. licenses -Ø-.

Nb.: As in MASC. I and II. above, the majority of examples are disyllabic; the second syllable is /əl/, /ən/ or /ər/. Exceptions to this are morphologically complex forms such as *Heldentum* or *Gewebe*.

Fensterverkäufer, Fensterfrage, Fensterersatz 'window-'

Märchensammler, Märchenzimmer 'fairy tale-'

Klosterbund, Klosterversammlung; Klösterbund has plural semantics for A 'convent-'

Kabelersatz, Kabelfrage, Kabelverkäufer 'cable-'

Segelverkäufer, Segeldrang, Segelersatz (can be interpreted as verb or noun) 'sail-'

Gewebefrage, Gewebeersatz, Gewebeverkäufer 'fabric-, tissue-'

Gewissensfrage, Gewissensamt, Gewissenszimmer 'conscience-'

Wachstumsfrage, Wachstumsamt 'growth-'

Lebensersatz, Lebensdrang, Lebensamt 'life-'

Class NEUT. I. is very similar to MASC. I. and II. in most respects. The differences are caused by a comparatively larger number of items in this class that are in some way morphologically complex, e.g. suffixed by *-tum*, *-lein*, *-chen* or prefixed by *Ge-*. All these examples show a tendency towards *-s-* linking elements, as do those where the *-s-* serves as a distinguishing marker to avoid verb interpretation (see *Handel* in MASC. II above). The general rule for items from this class is therefore identical with the rule given for MASC. I.

⁶² It is possible to interpret the *-s-* linking element after *Handel-* as a 'noun' marker, since without it the possibility of verb semantics arises.

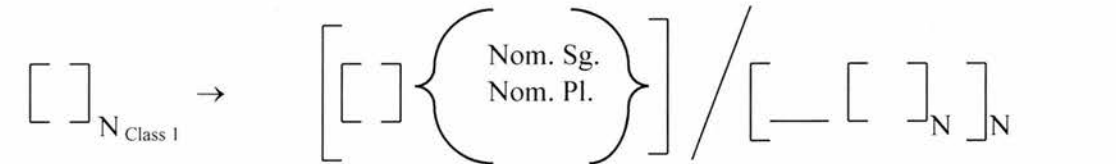
and II., but there will be a separate rule (see IV.3.13 and IV.3.14) for morphologically complex forms that overrides the one referring to the inflectional class.

The insertion rules for MASC. I., MASC. II. and NEUT. I. are identical, and so the rules for these three classes can be conflated:

Rules for MASC. I., II. and NEUT. I. ('CLASS 1'):

(1) Listed Exceptions (Stratum 1): *Himmels-, Friedens-, Handels-, Gewissens-, Lebens-*. These examples are analogy-driven, presumably originally Gen. Sg., but since *-s-* is not productive in this group, this seems irrelevant.

(2) Insertion of inflection (Stratum 2): the distinction between Nom. Sg. and Nom. Pl. is **semantically driven**. This distinction is only visible in MASC II, where some examples may have umlaut in the plural cf. **Äpfelverkäufer*, **Öfenzimmer* but: *Häfenbetreuer*.



-s- is blocked in this class, even though it is licensed in the Gen. Sg.

(3) The default rule does not apply. (Stratum 3)

IV.3.2.a MASC. III. Gen. Sg.: -(e)s, Nom. Pl.: -e

examples: *-es*: *Tag, Hund, Freund, Dienst, Grad, Dolch, Krebs, Mond, Stern, Zeugnis, Brief, Schritt, Stein, Arm, Aal, Halm, Pfad, Docht, Dom, Mord, Stoff, Punkt, Schluck, Laut, Lachs, Huf*; *Erfolg, Prozeß, Reflex, Suffix*.
-s: *Inhalt, Monat, Schuh, Käfig, Greis, Hering, Kürbis, Abend; Dekan, Delphin, Zwilling, Sekretär, Masseur, Regisseur, Kommissar*.
 morphologically complex: *Gefäß, Gewürz, Bericht, Erwerb, Vergleich, Verlust; Lehrling, Liebling, ...*
 homophonous verb available: (+ *-en*): *Beweis, Film, Fisch*.

licensed linking elements: Nom. Sg. licenses *-Ø-*, Gen. Sg. licenses *-s-* or *-es-*, Nom. Pl. licenses *-e-*.

Nb.: the examples in this class can be divided into two groups; one is of native/Germanic origin and mainly monosyllabic, the other of foreign stock with two or three syllables.

Almost all examples can occur without a linking element:

Krebsfrage, Krebsersatz, Krebsgeber 'crab-, cancer- '

Prozeßfrage, Prozeßzimmer 'trial- '

Mondzimmer, Mondverkäufer 'moon- '

Fischfrage, Fischersatz, Fischverkäufer, Fischfimmel (ambiguous) 'fish- '

Examples always occurring with -s-:

Lieblingszimmer, Lieblingsfrage 'favourite- '

Inhaltsfrage, Inhaltsgeber 'content- '

Monatersatz, Monatsbund 'month- '

Zwillingssammler, Zwillingssfrage 'twin- '

Examples which may occur with other linking elements:

Tagersatz, Tagesersatz, Tagesfrage, Tageszimmer, Tagzimmer? 'day- '

Freundesersatz, Freundesfrage, Freundesbund 'friend- '

Hundeverkäufer, Hundezimmer 'dog- '

Hufesammler 'hoof- '

All possible linking elements occur, with perhaps -Ø- and -s- being the most frequent ones.

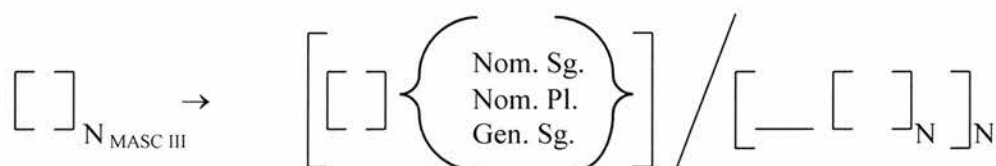
The cases where -en- occurs seem to be lexical exceptions of non-productive lexicalised examples (*Mondenschein, Sternenglanz* vs. **Mondensammler, *Sternenfrage*); the more archaic *Mondenschein* is being replaced by *Mondschein*, and the only other examples where non-licensed linking elements occur are of the type *Hahnenfuß, Schwanensee* (see IV.3.2.b below). However, the linking element -s- does not necessarily correspond to the semantics of genitive (*Zwillingsspaar*), -e- does not correspond to the meaning 'plural' (*Hundezimmer*); genitive semantics do not have to be marked by -(e)s- (*Filmvorführung*), and plural semantics does not have to be marked by -e- (*Dolchsammlung*). In other words, semantic criteria appear to be of little importance with regard to the choice of linking element in this class.

Overall, the vast majority of examples in this class occur without a linking element. The few examples that take -es- (*Freund, Tag*) possibly do so because they combine in compounds with more frequency than other examples, and they may take linking elements in analogical formation to already existing compounds. The reason why the otherwise overriding Nom. Pl.

licensed linking element does not occur frequently may be connected to the fact that it is /ə/, a linking element more usually associated with verb stem formation; see for comparison MASC. IV. where the plural inflection /ə/ is ‘supplemented’ by umlaut and occurs very frequently, and also cf. MASC.V. and VI. below, where *-er* and *-en* apply with great frequency.

Rules for MASC. III:

- (1) Listed Exceptions (Stratum 1): *Mondenschein, Sternenglanz*
- (2) Insertion of inflection (Stratum 2) – Both Nom. Pl. and Gen. Sg. rare-ish, and **analogy-driven, rather than semantically necessitated**.



- (3) Insertion of the default linking element (Stratum III)



Nb. these rules will also apply for NEUT. II., and similar rules will apply for MASC. IV.

IV.3.2.b MASC. IV. Gen. Sg.: -(e)s, Nom. Pl.: -e (Umlaut)

examples: *Ertrag, Stamm, Absatz, Arzt, Marsch, Ast, Ball, Schwanz, Frosch, Gast, Bart, Hahn, Wolf, Hals, Saal, Satz, Schatz, Schrank, Stall, Rock, Ton, Fluß, Busch, Stuhl, Turm, Zug, Bund, Chor, Fuchs, Gaul, Schwan, Storch, Floh, Strumpf, Bauch, Fuß, Darm, Kopf, Zopf, Schoß, Schopf; Kanal, General, Papst;*

morphologically complex: *Verstoß, Genuß, Gebrauch*

homophonous verb: (+ *-en*) *Schlag, Koch, Rat, Platz, Zahn*; (+ *-en*, + umlaut): *Kampf, Traum, Kamm, Knopf, Damm, Sturm, Wunsch*⁶³

⁶³ *Wünschelrute* ‘divining rod’ is lexicalised.

licensed linking elements: Nom. Sg. licenses -Ø-, Gen. Sg. licenses -(e)s-, Nom. Pl. licenses -e- (umlaut).

Nb.: The great majority of examples here are monosyllabic Germanic words. All examples have -es in the Gen. Sg. except *General*, *Kanal*; *Floh* (for phonotactic reasons).

In this class, not having a linking element at all again seems to be the most frequent option; all examples can occur without a link:

Gastersatz, *Gastfrage* 'guest-'
Kopfersatz, *Kopfzimmer* 'head-'
Arztfrage, *Arztsammler* 'doctor-'
Traumsammler, *Traumersatz* 'dream-'
Strumpfersatz, *Strumpfverkäufer* 'stocking-'

It is interesting to note that -Ø- is licensed in this class only in the Nom. Sg., while it had also been licensed in the Nom. Pl. in the three classes under discussion above.

The licensed -es- linking element occurs, but only in two examples: *Stammesfrage*, *Stammesersatz* 'tribe-' (probably in analogy to existing formations with *Stammes*-). The licensed -e- linking element is, however, possible with most items in this class; again the generalisation can be made that out of the licensed linking elements, the Nom. Pl. option is much more common than the Gen. Sg. one:

Gästezimmer, *Gästefrage*
Ärztebund, *Ärzteabend*, *Ärzteamt*
Röckeverkäufer 'skirt-'
Türmesammler 'tower-'

However, two restrictions apply to the insertion of -e-. First of all, formations from the group of potential homophonous verbs (+ -en, + umlaut) are banned from taking -e- linking element in combination with plural. In this group, it would be expected to have the Nom. Pl. (with umlaut) **blocked** because such a form may cause confusion with the verb form, e.g. *Knöpfezimmer*, *Träumezimmer*, *Dämmevorrichtung* etc. Thus, *Träumezimmer* is blocked if noun interpretation is sought, but *Träumeverkäufer* is possible with nominal interpretation

because *-verkäufer* requires A to be nominal. In accordance with findings in chapter III, the [[Vstem _] [N]] of the following forms should show umlaut, but not /ə/, since /ə/ is restricted to the phonological environment of /b, d, g, z, and ŋ/. The other group which offers possibilities of forming homophonous verbs [(+ -en): *Schlag* ‘hit’, *Koch* ‘cook’, *Rat* ‘council or advice; verb: to guess’, *Platz* ‘place’, *Zahn* ‘tooth; verb: to teethe’] is unaffected by the blocking effect, because the umlaut here distinguishes between verb and noun. Verb-stems would not show umlaut: *Schlagezimmer*, *Rategesellschaft*, *Kochverein*⁶⁴, while nouns would: *Köcheversammlung*, *Rätehaus*; cf. also IV.3.15.

The second restriction concerning to the insertion of *-e-* in MASC. IV. is that while it is **possible** to have *-e-*, Ø is always the preferred option. So, *Schwänesammler* ‘swan collector’ and *Fußfrage* ‘foot question’ are technically not ill formed, but will not occur if they are competing with *Schwansammler* and *Fußfrage*. Furthermore, the ‘linking element’ *-e-* carries plural semantics, which means that where it is inserted, A will be interpreted as a plural. This observation leads to the second generalisation: While Nom. Pl. overrides Gen. Sg. in this class, Nom. Sg. overrides both.

-s- is only licensed in a few examples; it occurs as a linking element in one example where it is licensed: *Generalszimmer*, *Generalsfrage*, *Generalsgenossenschaft* ‘general-’, but also occurs in *Ertragsfrage*, *Ertragsamt*, *Ertragsersatz* ‘output’, where it is not licensed and exceptional.

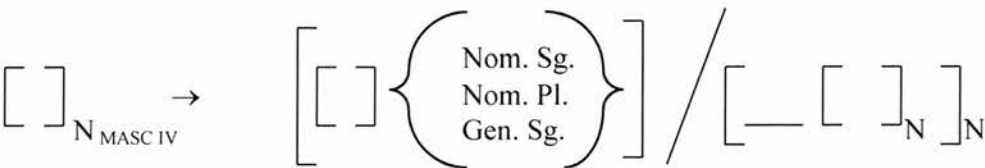
As with MASC. I. and II., MASC. III. and IV. differ only in the fact the Nom. Pl. in one class shows umlaut, while in the other class it doesn’t. This is important to note, because it is this distinction between the Nom. Sg. and Nom. Pl. that leads to more scope in the interpretation of the linking element which ‘happens to look like the Nom. Pl. inflection.’

⁶⁴ Nb. Just as the semantics of *-verkäufer* requires A to be a noun, the semantics of *-verein* strongly suggest that A is a verb.

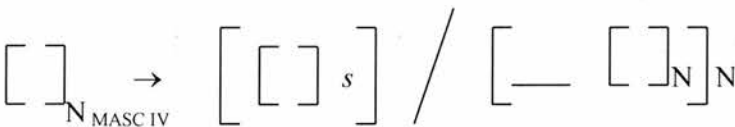
However, whenever *-e-* is used, it also causes umlaut, which means that the linking element *-e-* is in fact the nominative plural inflection. If the insertion of *-e-* were purely mechanical, the umlaut would not need to occur. This phenomenon is not only visible in class MASC. IV, but can also be backed up by semantics: whenever *-e-* occurs, it also occurs in combination with umlaut (signalling plural semantics), and it also always carries a plural interpretation (cf. *Gästezimmer, Ärztehaus*). However, this argumentation does not apply in the other direction; plural semantics does not require the plural inflection as a linking element.

Rules for MASC. IV:

- (1) Listed Exceptions (Stratum 1): *Schwanenhals, Schwanengesang* etc.
- (2) Insertion of inflection (Stratum 2) – few Gen. Sg., more Nom. Pl. and much more Nom. Sg.; *contra* MASC. III, here the Nom. Pl. inflection carries Nom. Pl. semantics.



- (3) Insertion of the default linking element (Stratum III)



IV.3.2.c NEUT. II. Gen. Sg.: -(e)s-, Nom. Pl.: -e

examples: (with Gen. Sg. in *-es*): *Meer, Pferd, Erz, Gas, Gift, Haar, Heft, Kreuz, Maß, Salz, Moor, Roß, Tor, Floß* (umlaut in Pl), *Fest, Suffix, Zeugnis, Inserat, Gewürz, Gefäß, Gesetz, Geheimnis, Verlies*;

(with Gen. Sg. in *-(e)s*): *Boot, Jahr, Schnitt, Brot, Beil, Recht, Glück* (no Pl), *Bein, Schaf, Paar, Pfund, Reich, Schiff, Schwein, Spiel, Stück, Ziel, Gebet, Gebot, Gelenk, Geschäft, Gewicht, Gespräch, Getränk, Gewehr, Verbot, Verhör, Ballett, Element, Krokodil, Konsulat*;
 (with Gen. Sg. in *-s*): *Adjektiv, Motiv, Klavier, Vitamin, Lineal, Modell, Metall, Magazin, Telefon, Ventil, Besteck, Blech, Kinn, Knie*
 morphologically complex: *Bergwerk, Erlebnis, Gefängnis, Zeugnis, Scheusal, Schicksal*
 homophonous verb: *Werk* (+ *-en*; not semantically related, though), otherwise this class contains no examples where a homophonous verb-stem is available.

licensed linking elements: Nom. Pl. licences *-Ø-*, Gen. Sg. licenses *-(e)s-*, Nom. Pl. licenses *-e-*.

Nb.: The nouns in this class show no obvious homogeneous qualities. Monosyllabic native vocabulary appears roughly as frequently as latinate items or complex formations.

As with class MASC. III., the *-Ø-* licensed by the Nom. Sg. is the most frequent linking element in NEUT. II. as well.

-s- occurs with a few forms only. It does not occur at all in the group that has *-es* in Gen. Sg., i.e. in the group where it is not licensed. In the second group which can alternate between *-es* and *-s* in Gen. Sg., *-s-* is linking element only in *Rechtsfrage, Rechtsbund* ‘law-’, *Glücksfrage, Glückssatz* ‘luck-’, *Werkverkäufer, Werksgenossenschaft* ‘factory-’, *Gesprächsfrage, Gesprächszimmer* ‘conversation-’, *Gewichtsfrage, Gewichtsverkäufer* ‘weight’. It is possible that the insertion of *-s-* here is related to the occurrence of *-s-* with these same examples in the lexicalised vocabulary (see IV.2.1 above on *Rechtsanwalt, Rechtsstaat, Rechtsverletzung, Gewichtsklasse, Gewichtsverlust, Gesprächspartner*, etc.) In the third group where *-s-* is licensed throughout, again it occurs only after very few examples; with the complex form *Bergwerksfrage, Bergwerksverkäufer* ‘mining-’ etc (cf. IV.3.14), and potentially (but not necessarily) after *Krokodil-, Adjektiv- and Lineal*⁶⁵.

One aspect of this class that is interesting to observe is the lack of *-e-* insertion. This is similar for examples from class MASC. III., (but unlike MASC. IV.) - both of which have

⁶⁵ It is unusual to find *-s-* insertion an ‘option’ with separate entries. Usually, the occurrence of *-s-* as a linking element is a much more clear-cut issue, where it cannot occur, it won’t, and where does occur, it **has to**. With the examples here, however, *-s-* is ‘tolerated’; *Krokodilverkäufer, Krokodilfrage* are well formed, but so are *Krokodilsverkäufer* and *Krokodilsfrage*.

the same licensed linking elements. The Nom. Pl. inflection that so dominates the choice of linking elements in other classes is here not a frequently chosen candidate for insertion after the first noun. As indicated above, the reason for this lies in the nature of the Nom. Pl. inflection. MASC. III and NEUT. II have *-e*, but without umlaut, while in MASC. IV, *-e* can only ever occur in conjunction with umlaut. The *-e-* linking element in compounds is more usually associated with the formation $[[Vstem _] [N]]$, rather than $[[N _] [N]]$. Therefore, /ə/ insertion in nominal compounding tends to be avoided (unless plural semantics are necessary and there is no possibility of confusing the resulting formation with a $[[Vstem _] [N]]$ construction. This would also explain why the linking element *-e-* **can** be inserted in MASC. IV much more freely; since it is additionally marked by umlaut, fewer possibilities for misinterpretations are given (contra: *Pferdeverkäufer* ‘horse seller’). *Glück* ‘luck’, which is an abstract noun with no plural, never takes the Nom. Pl. inflection, neither in existing nor in productive formations.

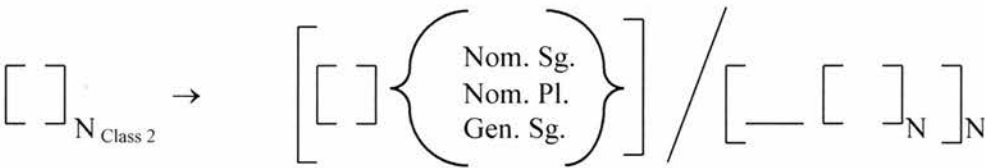
-es- does not occur as a linking element productively, even in the forms where it is licensed.

Overall *-Ø-* is preferred, *-e-* and *-es-* though licensed do practically not feature; *-s-* is inserted in morphologically complex forms and potentially available, though not required in a few forms which show analogy to existing compounds. The main insertion rules for NEUT. II. therefore are identical with the rules for MASC. III. and IV., even though the sub-rules (cf. importance of Nom. Pl. elements in these classes) vary.

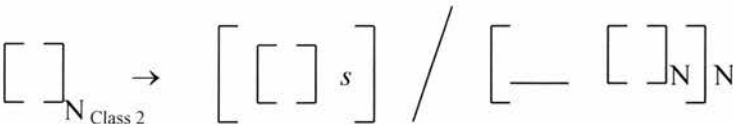
Rules for MASC. III., IV. and NEUT. II (CLASS 2):

(1) Listed Exceptions (Stratum 1): *Mondenschein, Schwanenhals, Instrumentenbauer*

(2) Insertion of inflection (Stratum 2): Nom. Sg. occurs most frequently, followed by Nom. Pl., which, for examples from MASC. IV. is semantically conditioned. Gen. Sg. only occurs if an analogical example for N₁ with genitive linking element already exists.



(3) Insertion of the default linking element (Stratum III)



IV.3.3.a MASC. V. Gen. Sg.: -(e)s, Nom. Pl.: -er (Umlaut)

examples: *Mann, Geist, Gott, Leib, Mund, Rand, Wald, Wurm.*
 morphologically complex: *Irrtum, Reichtum*
 homophonous verb: no examples

licensed linking elements: Nom. Pl. licenses -Ø-, Gen. Sg. licenses -(e)s-, Nom. Pl. licenses -er- (umlaut).

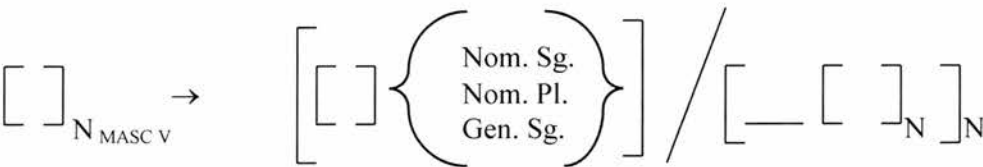
Nb.: All examples here are monosyllabic Germanic words, with the exception of formations in *-tum*. This is a relatively small class; its behaviour however is identical with the following, much larger class NEUT. III.

The previous analysis was only able to state that ‘all available linking elements occur and complex items **always** have -s-’. Observing the same class again in an approach which considers productivity offers new solutions. In this class, once again the Nom. Sg. -Ø- can apply everywhere, except after morphologically complex examples (cf. **Reichtumfrage*): *Gottfrage* ‘god-’, *Leibersatz* ‘body-’, *Waldverkäufer* ‘forest-’ etc. The other two licensed linking elements also occur; the Gen. Sg. (with genitive semantics) e.g. *Leibesamt*, *Geistesersatz* ‘mind-’, and the Nom. Pl. (with plural semantics) *Männerfrage* ‘man-’,

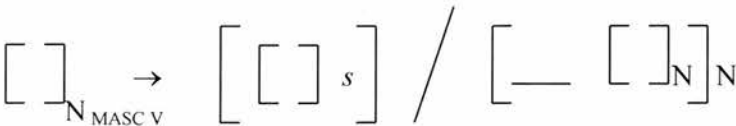
Götteramt. However, the main requirement for the occurrence of the Gen. Sg. is that the first element of the compound has already occurred in a lexicalised compound **with the linking element in question**, cf. *Leibeskraft*, *Geisteszustand*, *Gottesdienst* etc. As with the examples in class 2 above, Gen. Sg. linking elements are only inserted if they are based on an analogy to a precursor, where N₁ in an established compound has the genitive link. Those examples where established forms offer no parallel formations with the Gen. Sg. linking elements also will not take linking elements in newly coined formations, cf. *Mundwerk* ‘mouth’, *Waldfee* ‘wood fairy, dryade’. The two examples in *-tum* only ever occur with *-s-* (see IV.3.13 below), never with any other linking element, and also never without one.

Rules for MASC. V. (see NEUT. III below):

- (1) There are no lexical exceptions. (Stratum 1)
- (2) Insertion of inflection (Stratum 2) - Gen. Sg. inflection only used if **analogous form exists**, Nom. Pl. **driven by semantics**.



- (3) Insertion of the default linking element (Stratum III): suffixed examples only



IV.3.3.b NEUT. III. Gen. Sg.: -(e)s-, Nom. Pl.: -er (Umlaut)

examples: *Amt*, *Lied*, *Wort*, *Ei*, *Lamm*, *Buch*, *Dorf*, *Korn*, *Brett*, *Kind*, *Kleid*, *Band*, *Blatt*, *Dach*, *Fach*, *Faß*, *Pfand*, *Rad*, *Tal*, *Holz*, *Horn*, *Schloß*, *Volk*, *Huhn*, *Tuch*, *Haupt*, *Kraut*, *Feld*, *Geld*, *Nest*, *Schwert*, *Bild*, *Licht*, *Schild*; *Gemach*, *Gemüt*, *Gewand*, *Gesicht*, *Gespens*
 linking elements, licensed by the paradigm: *-(e)s-*, *-er*.
 morphologically complex: *Bistum*, *Fürstentum*
 homophonous verb: *Land*, *Haus*, *Loch*, *Kleid*, *Bad*, *Glas*, *Gras*, *Kalb* (+ *-en*)

licensed linking elements: Nom. Sg. licenses -Ø-, Gen. Sg. licenses -(e)s-, Nom. Pl. licenses -er-.

Nb. The make-up of this class is identical to that of MASC. V. The majority of examples are again monosyllabic native words.

Landzimmer, Landfrage 'land-'
Hausverkäufer 'house-', *Holzspiel* 'wood-'
Hornsammler 'horn-', *Schloßersatz* 'castle-' or 'lock-'
Buchsammler, Buchverkäufer 'book-'
Kindersatz 'child-', *Talgenossenschaft* 'valley-'
Dachzimmer 'roof-', *Nestbauer* 'nest-'

Most of the examples can occur without linking elements; except: *Gesicht, Gemüt, Amt*.

Ämtergenossenschaft, Ämterfrage 'office-'
Liedersammlung, Liederabend 'song-'
Kinderabend, Eierfrage 'egg-'
Länderamt, Häuserbund
Tücherzimmer 'scarf-', *Kräuterverkäufer* 'herb-'
Fächerersatz 'fan-', *Pfänderspiel* 'forfeit-'
Bildersammlung 'picture-', *Hühnerfrage* 'chicken-'

All examples can occur with the nominative plural inflection. However, whenever -er- is chosen, the umlaut occurs (signifying morphological plural), and a semantic shift can be observed. While it is true to say that -Ø- can still result in a generic interpretation, the -er- in the examples here is likely to force a semantic plural interpretation of N₁. Thus, e.g. *Hühnerfrage* refers to an issue concerning more than one hen. This is also true for examples with -er- in MASC. V.

However, only one example can occur with the (licensed) Gen. Sg. inflection: *Landesamt*. The insertion of -s- is also severely restricted because of the prominence of -Ø- and -er-; *Amtsgeber, Amtshaus* and *Volkersatz, Volkszimmer* are possible, but -s- is not used with any of the other examples. It is possible that the examples here which permit -es- or -s- are characterised by their linking elements as soon as they enter compounding; *Volk-* e.g. never stands without linking element in compounding, but compared to all other examples in the same class, this is exceptional behaviour.

Overall, it is true to say that items from this class enter productively into compounding with two linking elements; either the licensed *-er-* plural inflection, or the Nom. Sg. *-Ø-*. It is also interesting to note that wherever *-er-* is inserted as linking element productively, the semantic interpretation of ‘plural’ becomes obligatory. This is a significant observation if compared to the results of analysis (1), where no semantic reason could be found for the existence of *-er-*. The rules for class NEUT. III. are therefore:

Rules for MASC. V. and NEUT. III (CLASS 3):

- (1) There are no listed exceptions. (Stratum 1)
- (2) Insertion of inflection (Stratum 2) -- Gen. Sg. inflection only used if **analogous form exists**, Nom. Pl. **driven by semantics**.

$$[]_{N_{Class\ 3}} \rightarrow \left[[] \left\{ \begin{array}{l} \text{Nom. Sg.} \\ \text{Nom. Pl.} \\ \text{Gen. Sg.} \end{array} \right\} \right] / \left[_ []_N \right]_N$$

- (3) Insertion of the default linking element (Stratum 3): *Amts-*, *Gesichts-*, *Gemüts-*, *Volks-*.

$$[]_{N_{Class\ 3}} \rightarrow \left[[]_s \right] / \left[_ []_N \right]_N$$

For examples in *-tum* see IV.3.13 below.

IV.3.4 MASC. VI. Gen. Sg.: -(e)n, Nom. Pl.: -(e)n

examples: with schwa (after consonants, excluding *-el*, *-er* - and after *-ei* and *-au*): *Bär*, *Held*, *Mensch* (all monosyll.), *Elefant*, *Konsonant*, *Präsident*, *Optimist*, *Kandidat*, *Planet*, *Pilot* (all final stress).
 without schwa (after vowels, except *-ei* and *-au* -, and after *-el* and *-er*): *Genosse*, *Bote*, *Gatte*, *Insasse*, *Junge*, *Kollege*, *Laie*, *Neffe*, *Hase*, *Affe*, *Löwe*, *Pädagoge*, *Franzose*, *Herr* (Gen. Sg. usually in *-n*).
 morphologically complex: *Nachkomme*

homophonous verb: *Narr* (+en); *Erbe*, *Nachkomme* (+n)

licensed linking elements: Nom. Sg. licenses -Ø-, Gen. Sg. and Nom. Pl. license -(e)n-.

NB. Examples in this class are a mixture of native and foreign vocabulary. The alternation between -en and -n is purely based on phonotactics. The group that takes /ə/ is either monosyllabic or has final stress. The group that does not take /ə/ all end in -/ə/ (except *Herr*).

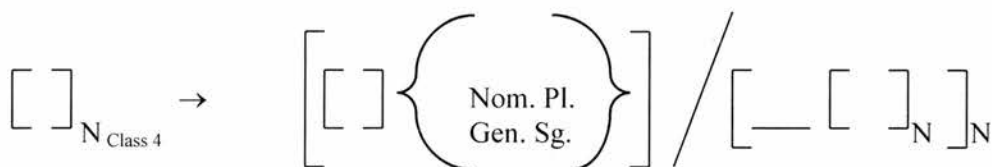
This class shows so far the most striking example of the dominance of -en as a licensed linking element over all other linking elements, including the default. Here, the doubly licensed linking element is the only possible option; all items from this class will, in the context [[N __] [N]], have -(e)n- inserted after the first noun.

*Bäre***n**sammler 'bear-', *Helde(n)genossenschaft 'hero-'
*Mensche(n)verkäufer 'human-', *Narre(n)spiel 'jester-'
*Konsonante(n)ersatz 'consonant-', *Präsidente(n)versammlung 'president-'
*Löwe*nzimmer 'lion-', *Botene(n)versammlung 'messenger-'
*Insasse(n)amt 'passenger-', *Affe(n)nfrage 'monkey-' etc.********

All examples ending in /-ə/ retain /ə/ in the link, i.e. the phonotactic restrictions applying to this distinction are retained when the inflections occur. -s- is not licensed in the paradigm because there is no Gen. Sg. containing -s-, and it does not apply as default, because there is a competing Gen. Sg. in -(e)n, and not, as e.g. in the feminine paradigm, -Ø-. The Nom. Sg. -Ø-, however, also does not apply. The rules for this class must mirror the importance of the doubly-licensed -(e)n- over any exception marking, and also over all default applications. The question of whether the semantics pertain to genitive singular or nominative plural is unanswerable; *Affenfrage* e.g. could concern just one, or several, monkeys (cf. *Hühnerfrage* above).

Rules for MASC. VI. (CLASS 4):

- (1) There are no lexical exceptions. (Stratum 1)
- (2) Insertion of inflection (Stratum 2) - not necessarily corresponding to semantics.



(3) The default rule does not apply. (Stratum 3)

NB. in class MASC VI., Nom. Sg. (i.e. a -Ø- linking element) is **not** an option. This is purely for morphological reasons (i.e. because of the inflectional class), and not due to phonotactic restrictions (e.g. because N₁ ends in /ə/, cf. MASC. IX. and FEM. IV. below). It would appear that classes in which /n/ occurs in both the Gen. Sg. and the Nom. Pl., -Ø- as a linking element is blocked.

IV.3.5.a MASC. VII. Gen. Sg.: -(e)s, Nom. Pl.: -(e)n

examples: with -es: *Staat, Mast, Schmerz*; with -s: *Dorn, Muskel, Pantoffel, Fleck, Pfau, Schreck, See, Stachel, Strahl, Typ, Untertan, Vetter, Diktator*.

morphologically complex: ?*Untertan*

homophonous verb (+ -en): *Schmerz, Nerv*

licensed linking elements: Nom. Pl. licenses -Ø-, Gen. Sg. licenses -(e)s-, Nom. Pl. licenses -(e)n-.

Nb. Mainly native vocabulary. The distribution of -en vs. -n is the same as in class MASC. VI.

This group does not offer quite such a clear dominance of the licensed Nom. Pl. as the previous class, but -(e)n is still the predominant choice of linking element.

Dornenfrage 'thorn-', *Nervenersatz* 'nerve-'
Strahlenzimmer, Strahlenpiel 'beam-'
Fleckensammler 'stain-', *Pfauenabend* 'peacock-'
Typenverkäufer 'type-', *Vetternbund* 'cousin-'
Seenfrage 'lake-'

Almost all examples in this class can occur with the -(e)n- linking element. Most of these carry some kind of plural semantics with them, which contrasts with the examples using -Ø-

after the first noun: *Seefrage* vs. *Seenfrage*, *Dornergatz* vs. *Dornengatz*. It is becoming increasingly clear that the insertion of the linking element which is licensed by the Nom. Pl. inflection will either be motivated by plural semantics, or at least cause the resulting form to have plural semantics. The evidence for these linking elements to be called simply ‘regular plural inflection’ is mounting up. However, there are some examples which never occur with any linking element: again, all examples in *-el* (cf. MASC. I.).

Muskelamt, Muskelzimmer

Pantoffelsammler, Pantoffelspiel

Stachelbauer, Stachelfrage

also: *Schmerzverkäufer, Schmerzgenossenschaft, Schmerzfrage*,

but: *Schmerz^{ens}frage*⁶⁶, *Schmerz^{ens}bund, Schmerz^{ens}sammler*.

There are two examples where a confusion with the homophonous verb is possible; therefore, if nominal interpretation is sought, *-en-* is used rather than *-Ø-*: *Strahlfrage, Strahlabend, Nervspiel, Nervzimmer*, where the A elements are more likely to be interpreted as verbs (cf. *Strahlenzimmer, Strahlenspiel* above). For more detail and more examples of this kind, see chapter III and IV.3.15.

The only example that can take *-s-* is *Staats* ‘state’⁶⁷ (e.g. *Staatszimmer, Staatsfrage*, but cf. *Staatenbund*); most likely in analogy to already existing compounds. *Untertans-* ‘subject’ might be possible, too, but the plural *Untertanen*⁶⁸ is clearly preferable. The licensed Gen. Sg. never occurs as a linking element.

Therefore, overall the Nom. Pl. licensed linking element is the most frequent, followed by the application of the Nom. Sg. *-Ø-*. The default *-s-* is so rare that it requires listing, and the

⁶⁶ Lexical exception (the linking element *-ens* is not licensed); formed in analogy to *Herzensbrecher* ‘heartbreaker’ etc., the only paradigm in which *-ens* is licensed: it is the Gen. Sg. inflection. Cf. IV.2.3 above; and also IV.3.7.a below (on *-ns*).

⁶⁷ Note, however, that this is not the licensed linking element, the Gen. Sg. of *Staat* is *des Staates*.

⁶⁸ *Untertanen* used to be the genitive singular inflection; it has now been superseded by *Untertans*.

Gen. Sg. does not occur at all. The rules for MASC. VII. are given below with the rules for NEUT. IV.

IV.3.5.b NEUT. IV. Gen. Sg.: **-(e)s-**, Nom. Pl.: **-(e)n**

examples: (with *-es*) *Hemd*

(with *-s*) *Bett*, *Elektron*, *Interesse*, *Auge*, *Ende*, *Juwel*

(with *-(e)s*) *Insekt*, *Statut*, *Ohr*

homophonous verb: *Leid* (+*en*), *Ende* (+*n*)

licensed linking elements: Nom. Pl. licenses *-Ø-*, Gen. Sg. licenses *-(e)s-*, Nom. Pl. licenses *-(e)n*.

Again, as with MASC. VII. above, *-(e)n-* is available as a linking element with all examples:

Bettensammler ‘bed-’, *Elektronenspiel* ‘electron-’

Juwelenersatz ‘jewel-’, *Insektenamt* ‘insect-’

Hemdenverkäufer ‘shirt-’, *Ohrenfrage* ‘ear-’

For examples that end in schwa, *-n* is obligatory: *Augenersatz*, *Interessenbund* (cf. **Auge-*, **Interesse-*).

Neither the licensed Gen. Sg. nor the default *-s-* occur in this class. While *Hemdsärmel* is well-formed in the existing vocabulary, there are no productive new formations involving *Hemds-* at all (or any of the other examples in this class). *Leidens-* ‘suffering’ is possible, again in analogy to existing forms (*Leidensgenosse* etc.), but more likely to originate in the nominalised verb *das Leiden* (NEUT. I, Nom. Sg.) rather than *das Leid*.

Overall, *-en-* is again more frequently available and more productive than the other linking elements. As with examples from MASC. VI and MASC. VII, wherever *-(e)n-* is available as a linking element, it occurs comparatively frequently.

Rules for MASC. VII and NEUT. IV (CLASS 5):

(1) Listed Exceptions (Stratum 1): *Schmerzensgeld*

(2) Insertion of inflection (Stratum 2): Nom. Sg. is blocked if *N₁* ends in /ə/.

$$\left[\begin{array}{c} \square \\ \square \end{array} \right]_{N_{\text{Class 5}}} \rightarrow \left[\begin{array}{c} \left[\begin{array}{c} \square \\ \square \end{array} \right] \left\{ \begin{array}{c} \text{Nom. Sg.} \\ \text{Nom. Pl.} \end{array} \right\} \end{array} \right] / \left[\begin{array}{c} \square \\ \square \end{array} \right]_{N} \left[\begin{array}{c} \square \\ \square \end{array} \right]_{N}$$

(3) The default rule applies for only one example (analogy-driven): *Staats-* (Stratum 3)

$$\left[\begin{array}{c} \square \\ \square \end{array} \right]_{N_{\text{Class 5}}} \rightarrow \left[\begin{array}{c} \left[\begin{array}{c} \square \\ \square \end{array} \right] s \end{array} \right] / \left[\begin{array}{c} \square \\ \square \end{array} \right]_{N} \left[\begin{array}{c} \square \\ \square \end{array} \right]_{N}$$

IV.3.6 MASC. VIII. Gen. Sg.: -(e)s, Nom. Pl.: -- / -e

examples: *Bedarf*, *Hunger*.

licensed linking elements: Gen. Sg. licenses -(e)s-, Nom. Pl. (theoretically) licenses -Ø-.

Bedarfsabend, *Bedarfsgenossenschaft*, *Bedarfszimmer* ‘need-’

Hungerfrage, *Hungerfimmel*, *Hungerzimmer* ‘hunger-’

It is very difficult to make far-reaching generalisations for a group that only has two exponents. One of the observations that can be made is that *Bedarf* does not take the licensed Gen. Sg. -es, but rather -s-, which is the default; and the Nom. Pl. is semantically either not possible or -e, depending on the context (cf. Duden, 1995). *Hunger* on the other hand only ever occurs productively without a linking element - despite existing forms such as *Hungersnot*, and despite the fact that there is the possibility of confusion with a homophonous verb. All the examples above (and in fact any new compounds that are formed with *Hunger-* as their first element) are open for interpretation as either noun or verb, provided the semantics of the second element in the compound allow this. Therefore, *Hunger-* is a true counter-example to the notion that in a compound AB, if A may be homophonous with a verb stem, it will be distinguished via the insertion of linking elements, see also IV.3.15 and chapter III.

Rules for MASC. VIII (CLASS 6):

2 listed examples on stratum 1: *Bedarfs-* and *Hunger-*

IV.3.7.a MASC. IX. Gen. Sg.: *-ns*, Nom. Pl.: *-n*

examples: *Name*, *Buchstabe*, *Gedanke*, *Wille*, *Friede*

homophonous verb (+ *-en*): *Glaube*

licensed linking elements: Nom. Sg. licenses *-Ø-*, Gen. Sg. licenses *-ns-*, Nom. Pl. licenses *-n-*.

Again, this is a rather small class, but at least the examples in it are similar in one respect: all end in /ə/. Here, this means that neither the licensed Nom. Pl. *-Ø-*, nor the default linking elements is allowed to apply; *-s-* does not feature because its application is blocked by the occurrence of both licensed linking elements (in particular by the competing Gen. Sg. in *-ns* (cf. MASC. VI, VII and NEUT. IV), and *-Ø-* cannot apply after /ə/. Both other licensed linking elements occur.

Namenssammler, *Namensamt* 'name-'

Willensabend, *Willensbund* 'will-'

Friedensbund, *Friedensfrage* 'peace-'

Glaubensamt 'belief'

Namenssammler

Gedankenbauer, *Gedankenersatz* 'thought-'

Buchstabenverkäufer 'letter-'

It appears that *Gedanke* and *Buchstabe* occur only with the Nom. Pl. linking element (**Gedankens-*, **Buchstabens-*); it is worth noting that they are the examples with three syllables in a group where exponents otherwise have only two. (Technically, they are also morphologically complex, but this argument should not really be admitted in these considerations since *Buchstabe* e.g. was a compound in Old High German already.) It could be argued that A elements which have three or more syllables show a restriction in their choice of linking element, e.g. that they can only take the default *-s-* or their licensed Nom. Pl. affix (cf. IV.3.13 and IV.3.14). It remains to be seen whether this is because of length or because they are morphologically complex in some way; the problem will be to distinguish

between the two criteria, since most Germanic words of more than two syllables will be, in historical terms, morphologically complex in some form or other.

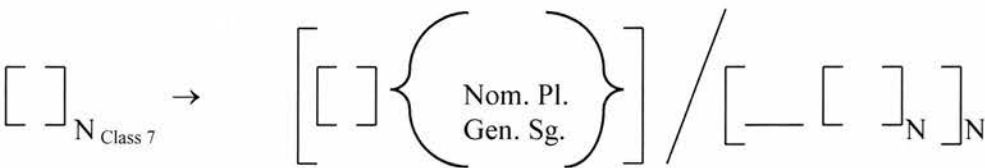
On the other hand the examples *Friede*, *Name*, *Glaube* and *Wille* seem to prefer the Gen. Sg. inflection to the Nom. Pl. And even though there are possible formations (cf. *Namensammler*, *Friedenverkäufer*), the preferred variant is that involving the Gen. Sg.: *Friedensbund*, *Glaubensfrage* etc. It is possible that a sentence-type analysis may yield findings here that involve underlying sentences and the cases they assign to the A element in the compound. E.g. ‘a collector of names’ *Namen-sammler* could be paraphrased as ‘er sammelt Namen’ (accusative) (i.e. generally), while *Namens-sammler* is ‘ein Sammler von Namen’ (genitive). Even though the semantic interpretation of the two different forms is virtually identical, the assigned case is different. Since it has previously been established that the distinction between singular and plural with *-sammler* is irrelevant as the collected objects can be referred to generically, it is interesting to note that case relations may possibly be expressed by the available linking elements. It would explain why it is e.g. *Willensfrage* and *Glaubensfrage* (‘eine Frage des Willens/Glaubens’ - genitive) and **not** *Willenfrage* etc. (* ‘question the will’ - accusative). The problem is, however, that it is not unambiguously the case that whenever the Gen. Sg. applies, genitive interpretation is required, cf. *Namensamt* (which does not have genitive semantics for A). It would appear that a genitive interpretation triggers the insertion of the Gen. Sg. inflection, and a non-genitive interpretation triggers Nom. Pl. As was the case in previous classes, the Gen. Sg. linking element is only inserted productively if a precursor is available to which the new form can be built analogously.

The possibility of confusion with a homophonous verb stem arises with only one example (*Glaube*). Here, the insertion of linking elements also causes the unambiguous assignment of nominal semantics to the A element; if there was no linking element, the word-final *-e-*

would appear ‘in the juncture position’ and would be interpreted as forming a verb stem:
Glaubezimmer, Glaubeamt, Glaubenspiel, Glaubeabend.

Rules for MASC. IX (CLASS 7):

- (1) There are no listed exceptions. (Stratum 1)
- (2) Insertion of inflection (Stratum 2) - driven by semantics:



Nb. Again, Nom. Sg. (i.e. -Ø-) is not an option in this class; /ns/ in Gen. Sg. and /n/ in Nom. Pl. prevent the insertion of -Ø-.

- (3) The default rule does not apply.

NEUT. V below will become part of this class as a lexical exception.

IV.3.7.b NEUT. V. Gen. Sg.: -ens-, Nom. Pl.: -en

example: *Herz*.
 licensed linking elements: Gen. Sg. licenses -ens-, Nom. Pl. licenses -en.

Herzensbund, Herzensgenossenschaft vs. *Herzgenossenschaft* ‘heart-’
Herzfrage, Herzzimmer, Herzamt, Herzspiel

The -ens- linking element is possible in new formations (analogous to *Herzensbrecher*), but comparatively rare, since it carries ‘old-fashioned’ associations with it. The Nom. Pl. inflection does not occur at all. It is interesting to compare *Herz* to the examples in MASC. IX above (which has the same inflections), but both classes are governed by crucially different rules; this may be connected to the fact that the examples there end in /ə/, while *Herz* does not: *Herz* **can** occur with the -Ø- link, while none of the examples in the previous

class can. However, since 'NEUT. V.' only contains one example, it is much more economical to list it as an exception with MASC. IX under class 7 above.

Rules for NEUT. V (within CLASS 7):

- (1) Listed Exceptions: *Herz* (either Nom. Sg. or Gen. Sg.)
- (2) etc. see class 7 above.

IV.3.8.a MASC. X. Gen. Sg.: -s, Nom. Pl.: -s

examples: *Park, Opa, Uhu, Vati, Akku, Pulli, LKW, Pier, Karton, Fan, Cocktail, Tip.*

licensed linking elements: Nom. Sg. licenses -Ø-; -s- is licensed in both Gen. Sg. and Nom. Pl. The -s the Nom. Pl. blocks -s- insertion.

Akkusammler, Akkuzimmer 'storage battery-'
Cocktailabend, Cocktailamt 'cocktail-'
Pulliverkäufer, Pullifrage 'jumper-'
Fanersatz, Fangenossenschaft 'fan-'

No linking elements ever occur in this class. -s- could be interpreted as licensed (it occurs in the Gen. Sg.) but is blocked from application as linking element by its occurrence in the Nom. Pl. This is a true instance of blocking which holds true throughout all paradigms: wherever -s is the Nom. Pl. of a N_1 , it will never occur after the first noun of a $[[N_1] [N_2]]$ compound. There may even be a possible explanation for this phenomenon: it could be argued that -s- as an exponent is more frequently associated⁶⁹ with the Gen. Sg. (-s as Nom. Pl. is a very rare occurrence in German), and therefore in cases where it might be confused with the Nom. Pl. is blocked from appearing altogether, see also IV.3.11 (FEM. VI.) and IV.3.8.c (NEUT. VI). Since -s- also happens to be the only licensed linking element, this group never occurs with any kind of linking element at all. The same analysis applies to the following two classes, FEM. VI and NEUT. VI.

⁶⁹ This is based on Humboldt's Universal which states that, ideally, one exponent should have only one meaning, and one meaning should be expressed by only one exponent. Subsequently, the concept is taken up again as that of 'perceptual salience' in Chapman (1995a and 1995b); for further details see chapter V.

The decision that it is the *-s* inflection from the Nom. Pl. which causes the blocking is further strengthened by the following class FEM. VI., which has \emptyset in the Gen. Sg. (unlike MASC. X. and NEUT. VI., which have *-s* there, too), and still *-s-* as a linking element is blocked.

The rules for MASC. X will be given under IV.3.8.c (class 8) below.

IV.3.8.b FEM. VI. Gen. Sg.: \emptyset , Nom. Pl.: *-s*

examples: *Oma, Lok, Bar, Party, Saison.*

licensed linking elements: Nom. and Gen. Sg. license \emptyset ; the licensed *-s* in the Nom. Pl. blocks application of *-s-* as a linking element.

Lokersatz, Lokfrage ‘locomotive-’

Partyzimmer, Partyabend ‘party-’

Barspiel, Barverkäufer ‘bar-’

As in MASC. X above, the presence of *-s* in the Nom. Pl. of the paradigm blocks *-s-* as a linking element. The only available option is no linking element at all. The rule for FEM. VI is given in IV.3.8.c below.

IV.3.8.c NEUT. VI. Gen. Sg.: *-s*, Nom. Pl.: *-s*

examples: *Echo, Sofa, Deck, Wrack, Hoch, Tief, Brikett, Korsett, Porträt, Genie, Hotel, Detail, Atelier, Mannequin.* (Nb. predominantly loans and adjective-noun conversions)

licensed linking elements: Nom. Pl. licensed \emptyset , Gen. Sg. and Nom. Pl. license *-s-*; the *-s* in the Nom. Pl. blocks insertion of *-s-* as a linking element.

Porträtsammler ‘portrait-’, *Sofafrage* ‘sofa-’

Hotelbauer ‘hotel-’, *Wrackersatz* ‘wreck-’

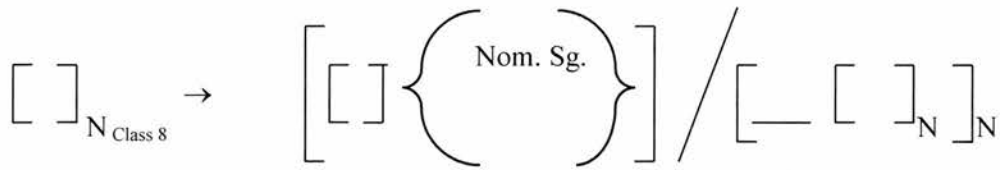
Detailfrage ‘detail-’, *Atelierersatz* ‘studio-’

Brikettverkäufer ‘briquette-’, *Mannequinspiel* ‘model-’

Again, *-s-* is blocked by the occurrence of \emptyset . The rules for NEUT. VI, FEM. VI and MASC. X are therefore identical:

Rules for MASC. X, FEM. VI and NEUT. VI (CLASS 8):

(1) Insertion of inflection (except -s) (Stratum 2)



(2) Insertion of -s in Nom. Pl. **for items not entering compounding.** (Stratum III)

Application of the default linking element -s- is blocked by the presence of -s in the Nom. Pl. of the inflectional paradigm (Stratum III).

IV.3.9 FEM. I. Gen. Sg.: --, Nom. Pl.: -- (Umlaut)

example: *Mutter, Tochter*.

licensed linking elements: Nom. and Gen. Sg. license -Ø-, Nom. Pl. licenses -Ø- (with Umlaut).

Cf. FEM. V below.

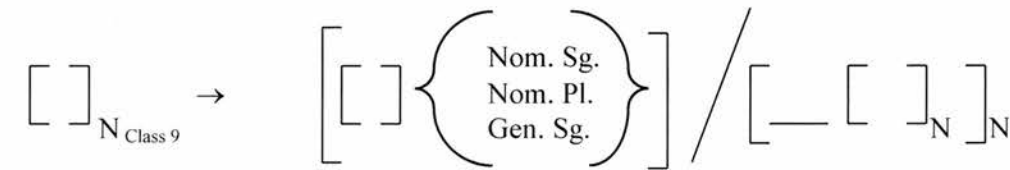
Mutterabend, Mutterersatz 'mother-'
Tochterfrage, Tochtterspiel 'daughter-'
Mütterversammlung, Mütterbund
Töchterbund, Töchttersammler

This is too small a class to say much about. The -Ø- linking element is licensed and occurs; plural is indicated by umlaut. That is, if umlaut occurs, the interpretation of A is generally plural; without umlaut, A can be interpreted as either singular or generic/plural. However, the FEM. classes here show an interesting trend, compared to the lexicalised examples in IV.2 above. In IV.2 it was stated that -s- is the predominant default linking element in all FEM. paradigms, because **there are no competing Gen. Sg. inflectional affixes**. For the class FEM. I this is clearly not the case, and it will be shown below that this generalisation does not hold in this way for all productive compound formations in the FEM. paradigm. The fact that -s- is relatively frequent is linked to the morphological complexity of A in a

compound AB, whereby A frequently **happens** to be feminine, rather than -s- being inserted on the strength of A being feminine alone.

Rules for FEM. I (CLASS 9):

- (1) There are no lexical exceptions.
- (2) Insertion of inflection (Stratum 2) - **semantically driven**



- (3) The default rule does not apply.

IV.3.10.a FEM. II. Gen. Sg.: --, Nom. Pl.: -e

example: *Kenntnis, Erlaubnis, Erkenntnis, Finsternis, Betr bnis, M hsal, Tr bsal*.
 licensed linking elements: Nom. and Gen. Sg. license - -, Nom. Pl. licenses -e.

Nb. all examples are morphologically complex; formed with either -nis or -sal.

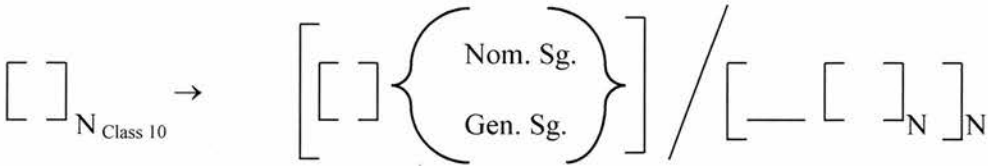
Erlaubnissammler ‘permission-’, *Erkenntnisabend* ‘recognition-’
Finsternisersatz ‘darkness-’, *Betr bnisspiel* ‘sadness-’

M hlsalsfrage, M hlsalszimmer ‘hardship-’
Tr bsalsbund, Tr bsalsverk ufer ‘misery-’

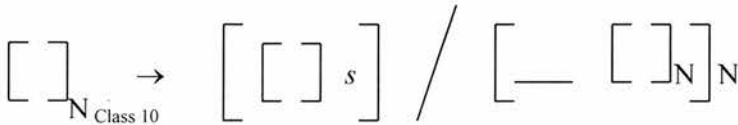
The default linking element for the FEM. paradigm is blocked after A elements ending in -s.
 This blocking, unlike the one in class 8, is purely phonotactic. The plural linking element -e-, albeit licensed, never occurs. Therefore, - - is the only option for examples in -nis, while -s- is the only option for examples in -sal. The rules for class FEM. II are quite distinct from the rules of class FEM. III (which is similar with respect to the inflectional endings; but the members of the two classes are very different), see below.

Rules for FEM. II (CLASS 10):

- (1) There are no listed exceptions. (Stratum 1)
- (2) Insertion of inflection (Stratum 2)



- (3) The default rule applies: *Mühsals-* *Trübsals-* (analogous to *Schicksals-*?)



IV.3.10.b FEM. III. Gen. Sg.: --, Nom. Pl.: -e (Umlaut)

examples: *Hand*, *Gans*, *Kraft*, *Bank*, *Macht*, *Stadt*, *Sau*, *Nacht*; *Ankunft*, *Auskunft*, *Zusammenkunft*, *Ausflucht*.
licensed linking elements: Nom. and Gen. Sg. license -Ø-, Nom. Pl. licenses -e (with umlaut).

Nb. examples are either native monosyllabic or complex (in *-kunft*, and *Ausflucht*).

- Handersatz* ‘hand-’, *Bankbauer* ‘bank-’
- Stadtabend*, *Stadtfrage* ‘town-’
- Nachtamt* ‘night-’, *Kraftzimmer* ‘strength-’
- **Ankunfte-* ‘arrival-’, **Auskunfte-* ... ‘information-’
- Städteamt*, *Städtebauer*
- Gänsesammler* ‘goose-’, *Händespiel*
- Kräftebund*, *Mächtenspiel* ‘power-’
- **Ankünfte-*, **Auskünfte-*

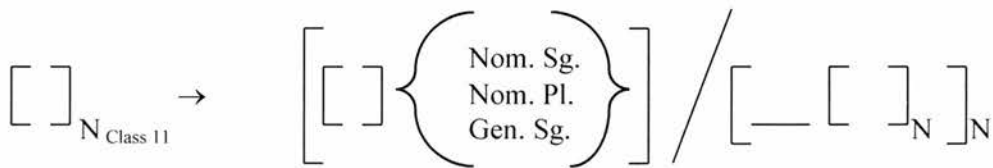
- Auskunftssammler*, *Auskunftsamt*
- Zusammenkunftsspiel*, *Zusammenkunftsabend* ‘meeting-’
- Ausfluchtsfrage*, *Ausfluchtssammler* ‘excuse-’
- **Krafts-*, **Stadts-*, **Hands-*

The licensed linking elements occur with the monosyllabic items in this class. Simultaneously, the default link -s- is not applicable in the same group, the insertion of the licensed linking elements overrules the insertion of the default. Again, here the strong

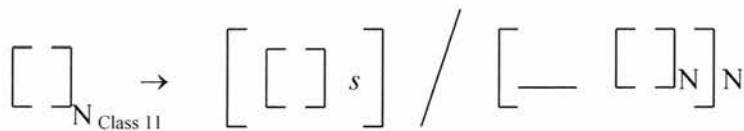
arguments for linking elements being in fact inflection are visible: the Nom. Pl. linking element **-e- never** occurs without simultaneously causing umlaut, i.e. **-e-** not only fills the link position between the two compound parts, but is also **always** plural inflection. Furthermore, if **-e-** and umlaut are present in a new formation, the overall interpretation of A will be plural. As expected, the morphologically complex items in this class take **-s-** (and only **-s-**) as their linking element.

Rules for FEM. III (CLASS 11):

- (1) There are no lexical exceptions.
- (2) Insertion of inflection (Stratum 2) -- semantically driven



- (3) The default rule applies to morphologically complex forms. (Stratum 3)



IV.3.11 FEM. IV. Gen. Sg.: --, Nom. Pl.: -(e)n

examples: (with **-en**) *Art, Burg, Fahrt, Flut, Frist, Last, Pflicht, Saat, Schrift, Tat, Tracht, Tür, Uhr, Wahl, Welt, Jagd, Frau, Geburt, Gefahr, Gewalt, Universität, Frequenz, Klinik, Kritik, Republik, Frisur, Explosion, Distanz, Chronik, Qualität, Nation, Prozedur, Grammatik; Gerberei, Schmeichelei; Arbeit, Neuheit, Flüssigkeit, Unvorsichtigkeit, Freundschaft, Wohnung*

homophonous verb (+ **-en**): *Form, Schlacht, Zahl*

(with **-n**) *Achse, Amme, Beere, Biene, Blume, Brücke, Decke, Farbe, Henne, Kirsche, Stunde, Tasse, Wunde, Tanne, Kirche, Nase, Wange, Gasse, Sardelle, Geschichte, Etage, Familie, Arie, Komödie, Kommode, Reportage, Kopie, Apotheke, Sirene, Zisterne; Semmel, Achsel, Insel, Kugel, Nadel, Schachtel, Schlüssel, Wurzel, Zwiebel, Parabel, Leber, Ader, Schwester;*

homophonous verb (+ **-n**): *Erde, Schule, Liebe, Asche, Gabel, Mauer*

licensed linking elements: Nom. and Gen. Sg. license **-Ø-** (not after vowels!), Nom. Pl. licenses **-(e)n-** (for all).

nb. This group is very big; the examples can be broadly grouped into three categories (with respect to their choice of linking elements): ending in a consonant, /ə/ or a /ə/ syllable. Monosyllabic, Germanic as well as non-Germanic and suffixed examples occur.

The linking element *-(e)n-* is available for all examples in this class with the exception of examples ending in either *-el* or *-er* (cf. MASC. VI *Muskel* etc.), and those which semantically do not permit a plural (*Rache-fimmel* 'revenge-', *Sahne-zimmer* 'cream-', *Hirse-abend* 'millet-', *Kreide-sammler* 'chalk-'; contra: *Seidenkleid* 'silk dress'). Both zero and *-s-* however are more restricted; neither can occur in post-vocalic positions here (cf. exceptions above and in other classes: *Liebesbrief*).

For examples ending in consonants (not, however, a 'schwa syllable', i.e. a syllabic sonorant), the Nom. Pl. inflection is available throughout (exceptionless): *Pflichtenabend* 'duty-', *Schlachtensammler* 'battle-', *Schuldenspiel* 'debt-', *Türenfrage* 'door-', *Geburtenamt* 'birth-', *Republikenbund* 'republic-', etc. As with the examples above, the presence of the plural inflection generally predicts plural semantics.

The application of the other licensed linking element, *-Ø-* is slightly more restricted. It occurs freely after all monosyllabic examples: *Burgabend* 'castle-', *Flutbauer* 'flood-', *Weltamt* 'world-', *Staatabend* 'state-', *Schriftbund* 'writing-', *Zeitsammler* 'time-', *Türspiel* etc., but also after *Frequenzsammler* 'frequency-', *Distanzfrage* 'distance-', *Klinikfrage* 'clinic-', *Kritikzimmer* 'criticism-' (note stress), *Frisuramt* 'hairdo-' (possible, but *Frisurenamt* better?) etc. *-Ø-* is blocked after examples ending in *-ität*, *-ion*: *Universität*, *Qualität*, *Explosion*, *Nation*, i.e. where *-Ø-* is blocked, because *-s-* applies. This rule applies also inversed: where *-Ø-* is possible, *-s-* is blocked.

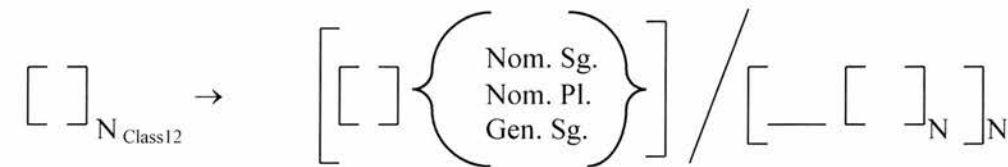
For examples ending in /ə/ both *-Ø-* and *-s-* are blocked throughout. Examples in /ə/, therefore, take the plural inflection just as exceptionless as the examples in consonants: *Blumensammler*, *Farbenbund*, *Hennensammler*, *Tassenabend*, *Brückenzimmer* etc. For

examples ending in a schwa syllable, both *-n* and *-s* are blocked, leaving only *-Ø-* as a possible linking element: **Kugelnabend*, **Kugelsabend*, **Inselnsammler*, **Inselssammler*, **Zwiebelnfrage*, **Zwiebelsfrage*, **Semmelknödel* etc.

The class has many examples where misinterpretation as a verb-stem can occur. For *Erde* and *Liebe*, it is possible to occur with the *-e-* after the first element of the compound (according to the rules that regulate $[[V_{stem} _] [N]]$ ⁷⁰) if they are to be interpreted as verbs, but not if they are nouns: *Erdebund*, *Erdeabend*, *Erdespiel* (where A is a verb-stem with the semantics of ‘to earth’) vs. *Erd(en)bund*, *Erd(en)bauer*, *Erd(en)spiel*⁷¹; *Liebezimmer*, *Liebespiel* vs. *Liebensammler*, *Liebesersatz* etc. Examples where the consonant which precedes schwa is **not** /b, d, g, z, ɳ/ use the same means to **force** a verb interpretation: *Formezimmer* ‘forming-’, *Schlachteabend* ‘butchering-’, *Zahlefrage* ‘counting-’. This is not possible for *Gabel* and *Mauer*, i.e. examples which end in a schwa syllable. For these examples, there is no unambiguous way to distinguish between verb and noun interpretation (other than the surrounding semantics). More on this issue in IV.3.15 below.

Rules for FEM. IV (CLASS 12):

- (1) There are no lexical exceptions.
- (2) Insertion of inflection (Stratum 2) -- Nom. Pl. has semantic links; Nom. Pl. is blocked after *-el*, *-er*; *-Ø-* is blocked after /ə/.



⁷⁰ Broadly, if the verb stem is the A element in a compound AB, and it ends in /b, d, g, z, ɳ/, then a schwa is inserted in the juncture position. See Ch. III for detail.
⁷¹ The variation in which the word-final schwa is also deleted is very frequent for this example, for both lexicalised and productive vocabulary cf. *Erdball*, *Erdanziehung*, *Erdbeben*, *Erdboden*, *Erdgeschichte*, *Erdkunde*, *Erdöl*, *Erdrutsch*, *Erdsatellit*, *Erdumdrehung* etc. See also below.

(3) Insertion of the default linking element. (Stratum 3) This is blocked after /s/, /ʃ/ or /ə/.

$$\left[\begin{array}{c} \boxed{} \\ \boxed{} \end{array} \right]_{N \text{ Class 12}} \rightarrow \left[\begin{array}{c} \boxed{} \\ \boxed{} \end{array} \right]_s / \left[\begin{array}{c} \boxed{} \\ \boxed{} \end{array} \right]_{N \text{ Class 12}} \left[\begin{array}{c} \boxed{} \\ \boxed{} \end{array} \right]_N$$

There is another phenomenon regarding the insertion point between $[[N \text{ — }] [N]]$, which only ever occurs in this class. As has been established above, examples that end in schwa need the plural inflection in order to enter compounding as an A element. However, some of these examples sometimes have that schwa deleted⁷², cf. *Kirchen*lied, *Kirchen*musik, *Kirchen*jahr vs. *Kirch*hof, *Kirch*gänger, *Kirch*turm. I mentioned a number of examples of this kind in IV.2.6 above, without being able to offer a solution. Considering there are other paradigms which contain numerous examples ending in schwa, phonotactic considerations do not seem to be the sole reason for the deletion; cf. MASC. VI. *Neffe*, *Löwe*, *Hase* etc., where the schwa never gets deleted. It seems that only examples from class FEM. IV (and one from NEUT. IV: *Auge*) are potential candidates for this extra ‘rule’. However, the amount of examples that is affected by this exceptional process is not sufficiently large to warrant the formulation of yet another rule: *Erd*-, *Farb*-, *Kirsch*-, *Schul*-, *Wund*⁷³-, *Nas*-, *Asch*-, *Kirch*-. The relative frequency with which each of these examples occurs as an A element in a compound (compare *Schul*- with *Nas*-), determines the overall amount of -Ø- formations that are possible for each example. Thus, *Erd*- and *Schul*- occur very frequently, while *Wund*- ‘wound-’ and *Nas*- ‘nose-’ are restricted to existing formations and would be ill-formed in newly coined formations. It is important to note that these are **not** stem compounds; if these forms could uniformly be interpreted as stems, one would also expect

⁷² It is possible that similar considerations may apply to examples like *Tant-chen* ‘aunt, dim.’, *Blüm-chen* ‘flower, dim.’ etc., where the diminutive affix does not attach after /ə/. This, however, is not restricted to specific word classes, but applies to all nouns ending in -e.

⁷³ An interesting example is “*Wund- und Heilsalbe*” (‘wound - and heal-cream’). *Wund*- cannot be confused with a homophonous verb, but is here used as if it were a verb. *Wunden- und Heilsalbe*, which would emphasise the nouniness of A, would sound odd.

**Tant-*, **Aff-*, **Löw-* for example; and this never, ever, happens. Considering that what is at stake here are eight examples, listing seems the best way to deal with them.

IV.2.12. FEM. V. Gen. Sg.: --, Nom. Pl.: --

examples: *Anmut*, *Gewähr*, *Gesundheit*, *Ganzheit*
 licensed linking elements: Nom. and Gen. Sg. and Nom. Pl. license -Ø-.

This class is only separated from FEM. I. because there it was possible to formally distinguish nominative singular and plural, while here it can be argued that it is not possible (semantically) for any of the examples to have a plural form at all. The licensed linking element -Ø- occurs after *Gewähr*; but for the other examples, -s- is the only possibility.

Gewährsammler, *Gewährverkäufer*, *Gewährfrage* ‘guarantee-’
Anmutersatz, *Anmutspiel*, *Anmutsfimmel* ‘grace-’
Gesundheitsamt, *Gesundheitsabend*, *Gesundheitszimmer* ‘health-’

Since it would not be prudent to argue that *Anmut* is somehow more ‘morphologically complex’ than *Gewähr*, the examples here would be better listed.

Rules for FEM. V. (CLASS 13):

- (1) There are no lexical exceptions. (Stratum 1)
- (2) Insertion of regular inflection (Stratum 2): *Gewähr* only. Plural is semantically impossible.

$$[]_{N_{Class13}} \rightarrow \left[[] \left\{ \begin{array}{c} \text{Nom. Sg.} \\ \text{Gen. Sg.} \end{array} \right\} \right] / \left[\text{—} []_N \right]_N$$

- (3) Insertion of the default linking element after all other forms. (Stratum 3)

$$[]_{N_{Class13}} \rightarrow \left[[]_s \right] / \left[\text{—} []_N \right]_N$$

IV.3.13 Morphologically complex⁷⁴ forms: linking elements after derivational suffixes

As has been pointed out repeatedly throughout both analyses, suffix-based generalisations can be made with respect to the choice of linking elements. Linking elements that occur after a N₁ that is suffixed are -Ø-, -s- and -en-.

-Ø- occurs first of all after suffixes which for phonotactic reasons cannot take -s- (those that end in -s) -nis and -mus: *Erlaubnissammler*, *Erkenntnisabend*, *Finsternisersatz*, (from FEM. II); *Erlebnissammler*, *Gefängnisverkäufer*, *Zeugniszimmer* (from NEUT. II); *Organismussammler*, *Rassismusabend*, *Optimismusfimmel* (MASC. exceptional declension: Nom. Pl. -men). -Ø- also stands after -ei: *Arzeneiverkäufer*, *Büchereiamt*, *Metzgereisammler*, *Reitereifrage* (from FEM. IV) (nb. Nom. Pl. -en- is also possible), and after the two diminutive suffixes -chen and -lein: *Engelchensammler*, *Häuschenverkäufer*, *Mädchenzimmer*, *Stückchenverkäufer*, *Türchenfrage* (from NEUT. I); *Brüderleinspiel*, *Kindleinfrage*, *Büchleinbund*, *Männleinsammler* (from NEUT. I). For the latter group -s- is licensed in Gen. Sg. and also a possible variation.

-s- is the single most frequent default linking element to be found after any suffixed N₁:

after -kunft: *Auskunftsamt*, *Zusammenkunftsabend* (from FEM. III)

after -heit: *Gesundheitsamt*, *Ganzheitsspiel* (from FEM. V) *Krankheitssammler*, *Einheitsfrage*, *Vergangenheitsfrage*, *Schönheitsverkäufer*, *Neuheitsfrage*, *Dummheitsbund* (from FEM. IV.)

after -keit: *Flüssigkeitssammler*, *Unvorsichtigkeitsspiel*, *Freundlichkeitsfrage*, *Eitelkeitsersatz*, *Herrlichkeitssammler*, *Übelkeitsfrage*, *Einigkeitsfimmel*, *Beständigkeitsbund* (from FEM. IV)

after -schaft: *Freundschaftsamt*, *Eigenschaftssammler*, *Verwandschaftsabend* (from FEM. IV)

after -ung: *Wohnungsgenossenschaft*, *Zeitungsabend*, *Heizungszimmer*, *Stimmungsspiel*, *Hoffnungsfrage*, *Neigungersatz* (from FEM. IV)

⁷⁴ This is taken to mean forms which have been affixed or compounded in some way, and are no longer 'morphologically simplex'.

after *-ion*: *Nationsamt, Kommuniionsabend, Explosionsfrage, Erosionsersatz*
 after *-tät*: *Universitätsabend, Qualitätsamt*
 after *-ling*: *Jünglingssammler, Sperlingsabend* (from MASC. III)
 after *Ge-*: *Gewebsersatz, Gewebsverkäufer, Gewissensfrage, Gewissensamt, Gewissenszimmer* (from NEUT. I)
 after *-ment*: (cf. IV.2.2) *Fundamentsersatz, Firmamentsfrage, Parlamentsersatz, Sakramentszimmer, Temperamentsfrage*. *-Ø-* is also possible: *Pergamentsammler, Abonnementfrage, Pigmentspiel, Regimentzimmer*.
 (*Instrument* is exceptional and will always occur with *-en-*)

From this selection it is quite clear that *-s-* applies by default after suffixed examples, **irrespective** of the example's class and inflectional paradigm. This observation is in keeping with previous findings which established the exceptional status of *-s-* as a default (rather than a licensed) linking element; it will be shown in IV.3.14 below that this is confirmed in the appearance of *-s-* after an A element which is in itself a compound.

Rather exceptionally, as mentioned in IV.2.2 above, some suffixed N₁s take *-en-* linking element, rather than *-s-*:

*-ant*⁷⁵: *Mandant, Kommandant, Pendant, Intendant, Applikant, Fabrikant, Musikant, Spekulant, Simulant, Gratulant, Querulant, Konsonant* etc.

-and: *Multiplikand, Summand, Konfirmand, Gourmand, Doktorand*.

-ent: *Kontinent, Resident*

-ist: *Kubist, Sadist, Pazifist, Cembalist, Minimalist, Anglist, Cellist, Solist, Bigamist, Organist, Pianist, Humanist, Chauvinist, Purist, Ventriloquist*.

All these examples are from MASC. VI. In this class, *-(e)n-* is licensed in both Gen. Sg. and Nom. Pl., and as has been established in IV.3.4 above, examples from this class only ever take the doubly licensed linking element *-(e)n-* as inflection following N₁; no other linking element (including *-Ø-*) may be inserted. It is therefore interesting to note that this rule has to apply before any default regulation that may require the insertion of *-s-* as the default

⁷⁵ Nb. all formations in *-ant*, *-and*, *-ist* and *-in* are animate, with the exception of *Restaurant* and *Sextant*.

linking element for morphologically complex A elements in a compound AB. Thus, while *-s-* insertion seems to be regular after most suffixed A elements (see above), examples where *-(e)n-* occurs are exempt from this.

The same argumentation applies to a group of examples from the feminine paradigm:

-in: *Gräfin, Gehilfin, Kollegin, Königin, Pädagogin, Zeugin, Köchin, Nachbarin, Pensionärin, Liebhaberin, Angeberin, Zauberin, Verkäuferin, Wahrsagerin, Siegerin, Sängerin, Apothekerin.*

These examples are taken from FEM. IV., which is the only FEM. class where *-(e)n-* is licensed. The examples all have *-en* as their regular Nom. Pl. inflection; the linking element *-en-* is therefore licensed and again **overrides the application of the default *-s-***.

Rules for the insertion of linking elements for suffixed N₁:

(a) $[[N] - \text{suffix}]_{\text{MASC. VI, FEM. IV}} \rightarrow [[N \text{ suffix}] \text{ en}] / [_ [N]]$ (Stratum 2)

(b) $[[N] - \text{suffix}_1] \rightarrow [[N \text{ suffix}_1] \emptyset] / [_ [N]]$ (Stratum 2)

for $\text{suffix}_1 = \text{-mus, -nis, -lein, -chen, -ei}$

(c) $[[N] - \text{suffix}_2] \rightarrow [[N \text{ suffix}_2] s] / [_ [N]]$ (Stratum 3)

for $\text{suffix}_2 = \text{all suffixes} \neq \text{suffix}_1$

IV.3.14 Morphologically complex forms: linking elements after compounds

The length of the compound seems to play an important part in some of the more major generalisations. If A in a compound AB consists of two or more morphemes, the probability of it having *-s-* as a linking element increases. This general tendency further increases according to the length of N₁, to the extent that (1) the presence of a linking element becomes obligatory and (2) the only possible form this linking element may take is *-s-*.

While the last section dealt with suffixed A elements, this one will briefly cast a glance at what happens when the first element in a compound is itself a compound. A few authors have commented on what may happen in situations such as this. Sönderberg (1968:16-18)

observes for Swedish compounds that it is usually -s- which occurs in the ‘juncture’ position of a compound where the first element is itself a compound. Briegleb (1935:24) points to the same phenomenon in German, using the examples of *[[Handwerks]zeug]* vs. *[Stein[werkzeug]]*. The short overview here, however, does not claim to be a complete analysis of the behaviour of linking elements after compounded A elements in a compound AB. The examples mentioned below deal with observations related to licensed vs. default linking elements; and furthermore only one kind of bracketing is analysed: *[[[N][N] __] [N]]*.

Already Wilmanns (1896:526) observes this phenomenon and cites these examples:

<i>Werk-zeug</i>	vs.	<i>Hand-werk-s-zeug</i> ‘tools’
<i>Hof-mauer</i> ‘wall (of a yard)’	vs.	<i>Kirch-hof-s-mauer</i> ‘wall (of a churchyard)’
<i>Rock-futter</i> ‘skirt lining’	vs.	<i>Unter-rock-s-futter</i> ‘underskirt lining’
<i>Welt-mann</i> ‘man of the world’	vs.	<i>Aller-welt-s-mann</i> ‘run-of-the-mill man’
<i>Nacht-zeit</i> ‘night time’	vs.	<i>Mitter-nacht-s-stunde</i> ‘midnight hour’

He further observes: “Die langen Wörter gewinnen durch das *s* übersichtlichere Gliederung, nur darf man darin nicht den Grund ihrer Bildung sehen.”⁷⁶ However, the insertion of a linking element -s- after a compound A element is not restricted to transparent compounds; some examples are obscured, and others could be better described as prefixation, e.g. *Fastnacht-s-beichte* ‘carnival confession’, *Hochzeit-s-gast* ‘wedding guest’, *Aufsicht-s-rat* ‘supervisory board’, *Ankunft-s-zeit* ‘arrival time’, *Einfalt-s-pinsel* ‘nincompoop’. Since this analysis is aiming to be a synchronic account, such observations are disregarded in the formulation of the conclusive generalisations below.

It is obviously futile to attempt to argue that the -s- under discussion could possibly be the Gen. Sg. licensed linking element; *der Mitternachts* or *der Hochzeits* are not well-formed Gen. Sg. forms. However, another interesting generalisation can be made with respect to compounds. In a compound *[N₁ N₂]_A*, the N₂ element may have -es as its genitive singular

⁷⁶ ‘The long words gain a clear organisation because of the -s-, but this must not be taken to be the reason for their formation.’

inflection. As soon as A is combined in a compound AB, the genitive singular of the form $[N_1 N_2]$ is -s, a phenomenon which could be prosodically motivated: *des Tages - Montags*; *des Hofes - des Kirchhofs*; *des Rates - des Hofrats*. Therefore, as soon as these formations enter into compounding, the Gen. Sg. inflection that is available through licensing is no longer the Gen. Sg. form of the original N_2 element [e.g. *Hof (des Hofes)*], but that of the compounds $[N_1 N_2]_A$ (*des Kirchhofs*). Therefore, any further compounding (*Kirchhofsmauer*) will just have the -s- linking element; the original Gen. Sg. cannot be allowed for licensing.

Rules for the insertion of linking elements in $[[[N_1][N_2] _]_A [N]_B]$

(1) Listed exceptions: All obscured compounds take -s-. (Stratum 1)

(2) Insertion of Nom. Sg. -Ø-. (Stratum 2)

$[[N_1] [N_2]]_A \rightarrow [[A] \emptyset] / [_ [N]]$
 e.g. *[Autobahn]kreuz*, *[Kinderwagen]vorhang*

(3) Insertion of the default -s-: elsewhere (Stratum 3)

$[[N_1] [N_2]]_A \rightarrow [[A] s] / [_ [N]]$

The same considerations and rules apply to A elements consisting of compounds of three (or more) items. The longer the overall compound, the more likely we are to find -s- after the first element of the compound. This may however also be connected to the fact that a great number of such complex compounds will contain elements that are suffixed with one of the suffixes that invariable attracts -s-. For examples like *Hauswirtschaftsverwaltung* or *Brüderlichkeitsverweigerer* it is impossible (and unnecessary?) to determine whether the -s- is triggered by the fact that A is a compound, or by the fact that N_2 in A is suffixed, with the suffix triggering -s. Even so, there are certain tendencies which can be observed, e.g. that it seems to be far more frequent in the combination of three nouns to have bracketing of the kind $[[[N][N] _] [N]]$ rather than $[[N] _ [[N][N]]]$ (e.g. *Gold-bergwerk*; *Kriegs-schauplatz* etc.) (cf. Wilmanns, 1896:509). Note also that other forms of bracketing result in other rules

for the application of linking elements; e.g. A + __ + [N₁ N₂]_B: *Bundes[innenminister]*, *Jahres[höchsttemperatur]*.

IV.3.15 Potential misinterpretation of A as verb stem - a case for blocking?⁷⁷

In a compound AB, the A element may be similar to or identical with a homophonous verb stem. While this does in some cases lead to a semantic ambiguity of the A element, in most examples blocking effects can be observed which aid unambiguous interpretation. Examples that are ‘open to misinterpretation’, and that may therefore be affected by such restrictions, fall into three groups:

- (a) [..XC]_N en]_V : *Strahl - strahlen*, (cf. *Strahlfrage*),
- (b) [..eC]_N n]_V (possible with umlaut): *Segel - segeln* (cf. *Segelfrage*),
- (c) [..Xe]_N n]_V : *Frage - fragen* (cf. *Fragespiel*).

Examples where the noun is identical to the infinitive of the verb, i.e. [N] = [V]_{inf} : *Graben* ‘trench / to dig’, *Braten* ‘roast’ do not pose the same difficulties. They are always interpreted as nominal if they are the first element in a compound⁷⁸: *Grabenfrage* is always interpreted as noun; if verbal interpretation were sought the -(e)n would have to be deleted to give *Grabefrage* or *Brathuhn*. Other examples are: *Schnupfen* (*Schnupftuch*, *Schnupfenmittel*), *Tupfen*, *Schaden* (MASC.); *Beben*, *Leben*, *Schreiben*, *Treffen* (NEUT.). A different issue (and one which shall not be dealt with here) are nominalised infinitives, see e.g. NEUT.I.: *Lebensart*⁷⁹.

⁷⁷ Chapter III deals with this topic in detail.

⁷⁸ The infinitive is quite rare as the first part of a compound (cf. chapter III); but see footnote 78 below. Note that, as with other potential ‘confusables’, semantic similarity is the *conditio sine qua non*; a pair such as *Wagen* ‘car’ and *wagen* ‘to dare’ would never be semantically confused.

⁷⁹ Nominalised infinitives are another group of nouns which invariably attracts -s- as their linking element: e.g. *Leben-s-zeichen*; *Reden-s-art*, -drang; *Wissen-s-durst*; *Essen-s-zeit*, -ausgabe; cf. also: *lesen-s-/loben-s-/lohn-s-/lieben-s- wert*; *sehen-s-/erwähnen-s -würdig*; cf. *tot-sterben-s-krank*.

In the preceding analysis (analysis (2)), all examples that may be affected in this way have been marked as 'homophonous verb available', and some of these cases have been discussed briefly. For most of these examples it is possible to avoid the interpretation of 'verb' if that of 'noun' is required, and vice versa. The main markers that are available to guarantee unambiguous interpretation seem to be /ə/ vs. /ən/ and umlaut vs. no umlaut. For group (3), for example, the distinguishing marker seems to depend crucially on the presence of /ə/ at the point of insertion; compare the semantics of examples such as *Bremse_N* 'brake' and *bremsen_V* 'to brake': *Brems-frage* (N or V) vs. *Bremse-frage* (V) vs. *Bremsenfrage* (N)).

This section briefly deals with a hypothesis which states that any process which leads to ambiguities in the semantic interpretation of A as either verb or noun is blocked. The 3 hypotheses are as follows:

- (1) Noun-final schwa following the A element of a compound [AB] is blocked if it results in a possible confusion of the A element with a homophonous verb stem.
- (2) The Nom. Pl. is blocked if it leads to an ambiguity with a verb stem. (This applies to the Nom. Pl. in /-ə/ as well as umlaut)
- (3) The Nom. Pl. is inserted if this helps to disambiguate what would otherwise be an A element which could be interpreted as either verb stem or noun. (This applies to any Nom. Pl. which is not /ə/, e.g. *-er*, *en*, umlaut etc.)

A hypothesis which bans /ə/ following the first element of a compound **unless A is a verb stem or the /-ə/ is produced by the Nom. Pl. inflection of an item that does not have a homophonous verb stem** takes as given that such a schwa can be inserted in the first place. The circumstances under which schwa is inserted after the verb stem of a [[Vstem _] [N]] compound has been described in detail in chapter III.

Group (a) [..XC]_N en]_V : *Strahl* - *strahlen* (cf. *Strahlfrage*)

MASC. III.: *Beweis*, *Film*, *Fisch*

MASC. IV.: *Schlag*, *Koch*, *Rat*, *Platz*, *Zahn*; (+ umlaut): *Kampf*, *Traum*, *Kamm*, *Knopf*, *Damm*, *Sturm*, *Wunsch*

MASC. VI.: *Narr*

MASC. VII.: *Schmerz*, *Nerv*, *Strahl*

FEM. IV.: *Form*, *Schlacht*, *Zahl*

NEUT. III.: *Land*, *Haus*, *Loch*, *Kleid*, *Bad*, *Glas*, *Gras*, *Kalb*

NEUT. IV.: *Leid*

Examples that appear in group (a) are largely unaffected by criteria (1) and (2), since mainly /b, d, g, z and ŋ/ are followed by /ə/ in [[Vstem] [N]] compounding, and many nouns here do not have -e in their inflectional paradigm. Of the ones that do, only MASC. III.'s *Beweis*, *Film*, *Fisch* are problematical, since the examples in MASC. IV. can be disambiguated by umlaut. Ultimately, for MASC. III., the decision of whether a form is the verb stem or the noun has to be based on the surrounding semantics; both Nom. Sg. *Filmfrage* and Nom. Pl. *Beweisespiel* could be confused with the verb stem. The examples of MASC. IV. can be divided into two sets. Both take -e with umlaut to form the Nom. Pl., but *Schlag*, *Koch*, *Rat*, *Platz*, *Zahn* form the verb without umlaut. Therefore, to unambiguously achieve nominal interpretation for this set, the regular Nom. Pl. inflection needs to be inserted *Köchefrage* (nominal) vs. *Kochfrage* (ambiguous). The second set, *Kampf*, *Traum*, *Kamm*, *Knopf*, *Damm*, *Sturm*, *Wunsch* forms the plural in the same way, but forms the verb also with umlaut; therefore, the Nom. Sg. -Ø- would be sufficient to guarantee nominal semantics (*Träumzimmer_V* vs. *Traumzimmer_N*).

Otherwise, only if the linking element is -Ø- can a possible confusion with the verb stem arise, e.g. in MASC. VII: *Strahlspiel*, *Nervfrage* where both A elements can be interpreted as noun or verb. Such misinterpretation can however be avoided if hypothesis (3) is adhered to, i.e. by the insertion of the Nom. Pl. inflection after the first noun of the compound: *Strahlenspiel*, *Nervenfrage*. For all examples of group (a), except for MASC. III. and IV., the Nom. Pl. inflection -en or -er ensures nominal semantics for A.

Group (b) [..eC]_N n]_V (possible with umlaut): *Segel* - *segeln* (cf. *Segelfrage*);

MASC. I.: *Tadel, Hobel, Donner, Anker*

MASC. II.: *Handel, Nagel, Sattel, Acker; Hammer, Vogel* (+ umlaut)

MASC. VIII.: *Hunger*

FEM. IV.: *Gabel, Mauer*

NEUT. I.: *Schnitzel, Pendel, Lager, Segel, Wunder, Rätsel; Zeichen*

The majority of examples which end in a 'schwa syllable' (or, more precisely, a syllabic sonorant, cf. /ha:gl/, /Ru:dR/ etc.) do not take a linking element at all. Therefore, most of them have no option to distinguish nominal from verbal interpretation of the A element; cf. MASC. VIII *Hunger*, FEM. IV *Gabel, Mauer*. Only in a few lexical exceptions, -s- may be inserted to achieve noun semantics: *Handelsamt, Handelszimmer* analogous to: *Handelsgesellschaft, Handelskammer* vs. *Handelabend* (where a verbal interpretation is possible). For examples which distinguish singular from plural via umlaut, where umlaut may also lead to a homophonous verb and verb interpretation is not required, umlaut is banned (hypothesis (2)): MASC.II, *Vogelverkäufer*⁸⁰ but cf. *Vogelzimmer, Vogelhäuschen* (where umlaut is blocked provided a noun interpretation is sought). While this may sound like a solid generalisation, it is important to keep in mind that the number of examples which is affected in this way is very small (I could find only two, *Vogel* and *Hammer*). Also, depending on the direction from which this issue is approached, it could be argued just as convincingly that the plural umlaut is not readily available in items ending in a schwa syllable throughout affected classes (cf. other (non-alternating!) examples from MASC. II), irrespective of a homophonous verb stem being available, cf. **Äpfel*-, **Öfen*-.

Group (c) [..Xe]_N n]_V : *Frage* - *fragen* (cf. *Fragespiel*)

MASC. VI.: *Erbe*

MASC. IX.: *Glaube*

FEM. IV.: *Liebe, Salbe, Probe, Schraube, Bleibe, Reibe, Kerbe, Schmiede, Rede, Weide, Wende, Erde, Binde, Strafe, Pfeife, Reife, Seife, Schärfe, Taufe, Klage, Frage, Trage, Sage, Säge, Fliege, Folge, Wiege, Geige, Schlinge, Klinge, Woge, Sorge, Fuge, Lüge, Krähe, Wache, Schwäche, Zeche, Asche, Mühe, Ruhe, Hacke, Decke, Strecke, Locke, Flocke, Senke, Klinke, Harke, Stärke, Feile, Eile, Falle, Stelle, Quelle, Welle, Rolle, Fülle, Perle, Schule,*

⁸⁰ *Vogelverkäufer* is not quite as good, but possible; misinterpretation as a verb is impossible because of the semantics of *Verkäufer*.

Stimme, Summe, Wärme, Träne, Schiene, Spinne, Lehne, Pumpe, Schleppe, Schippe, Wippe, Knospe, Raupe, Hupe, Leere, Schmiere, Ehre, Lehre, Hure, Blase, Fliese, Lese, Speise, Reise, Weise, Bremse, Messe, Presse, Brause, Miete, Niete, Dichte, Beichte, Falte, Ernte, Flöte, Härte, Bürste, Wette, Hexe, Pflanze, Münze, Petze, Spitze, Sülze, Glotze
 NEUT. IV.: *Ende, Erbe*

Here, the word-final segment is /-ə/, i.e. the unaffixed noun and the verb-stem (which has been affixed with a /ə/ to serve as linking element, in the environment described in chapter III) are homophonous. However, such a confusion hardly ever actually occurs: misunderstandings of this sort are prevented by blocking effects, which can be observed if the compound formation of these examples is studied closely. It is this group of examples for which hypothesis (1) was originally formulated because here all nouns end in *-e*, i.e. they could all be perceived as verb stems to a greater or lesser extent - unless that schwa is deleted or subsidised by inflection⁸¹. Examples in this group stem mainly from one class, namely FEM. IV. Since FEM. IV has -Ø in the Gen. Sg., the only possible inflection that can apply to guarantee nominal interpretation of A is that of the Nom. Pl.: *-n*.

Note that examples where the Noun and the Verb bear no close semantic relation have been omitted, e.g. *Schütze* 'marksman' or 'Sagittarius' vs. *schützen* 'protect'; *Leiste* 'border' or 'groin' vs. *leisten* 'do, achieve'; *Stille* 'silence' vs. *stillen* 'nurse (baby)', similarly *Zeuge*, *Linse*, *Rate*, *Flechte*, *Raute*, *Klaue*.

For this group, then, it is assumed that in compounding the Nom. Pl. inflection is inserted whenever nominal semantics are required: *Geigenersatz* 'fiddle replacement', *Stellenabend* 'job evening', *Raupenfrage* 'caterpillar question'. Only if an interpretation as a verb stem is desirable is the Nom. Pl. not used; depending on the preceding phonological material⁸², the *-e* remains in the post-N₁ position or is deleted: *Salbefimmel* 'creaming craze', *Pfeifabend* 'whistling evening', *Brausespiel* 'bubbling game', *Beichtfimmel* 'confessing craze'. There is

⁸¹ Similar semantics of noun and verb are required for this; pairs such as *Schabe* 'cockroach' vs. *schaben* 'to scrape' would not pose a problem.

⁸² /b, d, g, z, ɳ/

a small number of examples in this group which cannot take the plural because they are not count nouns, and which would therefore be more likely to be interpreted as verbal in a compound: *Schärfe* ‘sharpness / to sharpen’, *Asche* ‘ash’, *Ruhe* ‘silence’, *Eile* ‘haste / to make haste’, *Wärme* ‘warmth / to warm’, *Leere* ‘emptiness / to empty’, *Schmiere* ‘grease / to smear’; ? *Schärfeabend*, ? *Schärfabend*; ? *Wärmespiel*, ? *Wärmspiel*. Note that *-n* is blocked in the new data if it is not semantically permitted.

The instances of true ambiguity can thus be reduced to only a few instances (in bold), compare:

‘rice’	‘journey’	‘to travel’
<i>Reis_N</i>	<i>Reise_N</i>	<i>reisen_V</i>
<i>Reis-tafel</i>	<i>Reise-leiter</i>	<i>Reise-drang</i>
<i>Reis-sack</i>	<i>Reise-tasche</i>	<i>Reise-tasche</i>
<i>Reis-esser</i>	<i>Reise-frage</i>	<i>Reise-frage</i>
<i>Reis-sammler</i>	<i>Reisen-fimmel</i>	<i>Reise-fimmel</i>
<i>Reis-abend</i>	<i>Reisen-sammler</i>	

In the example *Reiseleiter* A has got to be a noun because *-leiter* requires A to be nominal.

As with the argument concerning the blocking of umlaut on grounds of misinterpretation in group (b) above, in group (c) the blocking of /ə/ following the first element of a compound which is **not** verb stem forming can be turned on its head. All examples which end in *-ə/* have the Nom. Pl. in *-n*; which, as has been pointed out numerous times throughout analysis (2), is the most predominant linking element wherever it is licensed. Therefore, if a noun enters into compounding which is from one of these classes where *-(e)n* is the Nom. Pl. inflection, it is most likely to take *-(e)n-* as its linking element, irrespective of whether or not a homophonous verb stem is available. Overall, therefore, while there seems to be sufficient evidence to make a convincing case for blocking concerning instances where a noun is

homophonous with a verb stem as the A element in a compound [AB], there are other factors which lead to the same result (i.e. disambiguation), which are also motivated elsewhere in the analysis and thus have to be seen as superior.

IV.4 Conclusion

This chapter has dealt in detail with the issue of 'linking elements' in German nominal compounds. Two different analyses have been presented; the first observes the occurrence of linking elements in established, lexicalised compounds and takes the linking elements as the starting position. The second analysis deals with newly coined data, and begins the examination with the first noun's membership of inflectional class. Both approaches are founded on the assumption that in a compound $[[N_1 \text{ ___ }] [N_2]]$, the inflectional class of N_1 crucially influences the choice of linking element. That is why I have chosen to group linking elements in two sets, those that are 'licensed in the inflectional paradigm', and those that are not. For any noun, there are three 'licensed linking elements': the nominative singular inflection (always -Ø), the genitive singular inflection and the nominative plural inflection. These are the linking elements which can 'legitimately' occur after the first element in a compound, and which have the best potential for being finally validated as inflection proper. Any linking element which occurs unlicensed cannot be said to be inflection, and requires either exception marking or (for -s-) is assigned default status.

In analysis (1) the number of compounds which had linking elements following N_1 which were licensed was very large, but the semantic correlation between them was poor, and there was also a significant number of exceptions. This must be largely due to the nature of the data; lexicalised vocabulary can be expected to show signs of fossilisation and non-transparent morphology. Since all compounds here are 'established', it is much more likely

that a very large number of them is actually listed in the speaker's lexicon, and does not need to be produced on-line. Analysis (2) on the other hand offers a much better overview of the productive aspect of linking elements. Generalisations that could only be assumed in the first analysis can be shown to be actually productive; semantic motivation for the insertion of licensed linking elements (i.e. inflection) is much better (though still not perfect; but then, what is?) and the default rule can be shown to interact in the predicted way with the regular insertion rules, namely according to stratification. Only if no other insertion of licensed linking elements (i.e. inflection) has applied on stratum II is it possible for the default insertion of -s- to apply on stratum III.

It is therefore possible to conclude that all licensed linking elements in German nominal compounds are actually inflection; this is true for both, those occurring in lexicalised data as well as for the ones in newly produced structures. While all linking elements in established formations can be said to be fixed in some way, the productive, and frequently semantically driven insertion of inflection in novel items is conclusive evidence that linking elements in compounds are by no means all former inflection which is now only spread accidentally or by analogy. As will be discussed in detail in chapter V., the aspect of listedness of the established compounds (and the linking elements which are listed with them) depends on the length of time the word has been around, the number of people it is used by, and the frequency with which it is used. The result is a 'degree of listedness'; i.e. the more these criteria appear to apply, the more likely it is that the word is not produced on-line and has translucent morphology, but can be semantically and morphologically obscure.

It is also important to emphasise again the difference between the processes involved in the insertion of linking elements in [[Vstem _] [N]] compounds versus those in [[N __] [N]] compounds: In the former, it is a clear case of stem compounding, where a schwa is inserted to add to, or to form, the verb stem, and no inflection ever occurs. Contrary to this, in

nominal compounding in German it is possible to get inflections inside compounding. Therefore, in a compound $[[N_1] [N_2]]$, N_1 is always inflected; it may also have an additional default linking element, *-s-*.

While it would be too much to repeat all the separate rules that have been formulated for all the separate classes at this point, it is possible to formulate a number of generalisations which apply across inflectional classes. There are, for example, some phonotactic blocking effects which apply in general:

- (1) $s, \int]_A$ blocks *-s-*

After A elements ending in */s/* or */ʃ/*, the linking element *-s-* is blocked.

- (2) $\text{ə}, \text{ər}, \text{ən}]_A$ only allows *-Ø-*, in a few exceptional cases also *-s-*.

- (3) *-Ø-* rarely applies (even though it is licensed) after vowels, especially schwa. (There are exceptions: *Reiseleiter* and all abstract nouns from FEM. IV.) The question remains whether this is simply due to a phonotactic constraint on word-final **non-inflectional** */ə/* or the fact that nouns ending in */ə/* have *-n* as the Nom. Pl., which tends to override any other linking element.

A reason why it would be possible to argue for blocking in case of word-final schwa is linked to Chapman's principle of 'one exponent - one function' (see also chapter V), which is based on Humboldt's Universal. It simply states that ideally only one exponent is associated with only one function, and that it should therefore be avoided to use the exponent for a different function. This should be seen as a very tentative suggestion only, but in an overwhelming number of instances in compounding in German, 's' is most reliably associated with 'genitive' semantics - which might explain why it is blocked following N_1 in a compound $[[N_1 \text{ ___ }] [N_2]]$ if it occurs in the nominative plural. Similarly, a schwa in this position may be more frequently associated with 'verbiness', and therefore undesirable in $[[N \text{ ___ }] [N]]$ compounds.

There are some semantic patterns which can be observed overall, but note that these are sketchy at best, and can really only be termed ‘tendencies’, since there are many exceptions, sometimes even whole classes (e.g. MASC. VI.), to which they do not apply. These patterns can only be observed with any regularity at all in the new data from analysis (2):

(4) If genitive semantics is required, the Gen. Sg. inflection is inserted.

(5) If the Gen. Sg. inflection is used, the semantics is genitive.

(6) If plural semantics is required, the Nom. Pl. inflection is inserted. This is much rarer than (4), due to the possibility of expressing plurality ‘generically’. However, it also means that the Nom. Pl. inflection (e.g. in FEM. IV.) is blocked for abstract nouns which semantically cannot take a plural. As has been mentioned in 1.4, there is a noticeable differences in behaviour of the plural marker versus the case marker in general, which Booij (1996) connects with a much more inherent distinction between the two processes.

(7) If the Nom. Pl. inflection is used, the semantics is plural.

However, sometimes Gen. Sg. or Nom. Pl. inflections are used which do not correspond with semantics - sometimes to avoid homophony with a verb stem, but other times for no discernible reason at all. In some classes the ‘dominance’ of the linking element (e.g. the ‘doubly licensed’ *-(e)n-* in MASC. VI.) will override any semantic considerations and be inserted whether case and number are appropriate or not.

And finally, there are some morphological blocking effects which apply across all inflectional classes:

(8) *-s* in Nom. Pl. blocks *-s-*

After A elements which have */-s/* as the Nom. Pl. inflection (classes MASC. X., FEM. VI. and NEUT. VI.) the linking element *-s-* is blocked.

(9) Morphologically complex A forms, both suffixed and compound forms, attract the default linking element *-s-* (except: *-ant*, *-and*, *-ent*, *-ist* which take *-en-*, and are all in MASC VI. and *-in* from FEM. IV. In both exceptional classes the Nom. Pl. is *-en*).

(10) *-(e)n-* : This is somehow the most dominant linking element of them all. In classes where it is licensed it will occur almost exceptionlessly, and irrespective of semantics.

(11) Analogy: Some unusual formations can be observed in the new data which are purely based on analogy; particularly if the form is somehow exceptional (e.g. *Rechts-*). New formations with *Recht-* will be based on analogy to already existing and established compounds with *Recht-*, i.e. *Rechts-*, even though this is not one of the licensed linking elements, and the class overall does not employ the default *-s-* productively.

In his analysis of linking elements in German nominal compounds, Žepić (1970:57) observes:

“Allerdings sind auch hier ebensowenig wie in anderen Fällen diese Einschränkungen mit logischer Folgerichtigkeit ausnahmslos durchgeführt, weil immer eine bestimmte Wahrscheinlichkeit besteht, daß das zu Erwartende nicht eintreten wird. Dann aber läßt sich doch erkennen, warum das zu Erwartende nicht geschehen ist.”⁸³

While this is doubtlessly true for the lexicalised data in analysis (1), I hope to have shown in analysis (2) that the productive insertion of inflection as well as genuine linking elements in nominal compounds is not as irregular as all that.

⁸³ ‘Here, as in other cases, the restrictions do not apply with logical consequences and exceptionlessly, because there is always a certain probability that the expected will not occur. However, it can subsequently be detected why the expected did not occur.’

Chapter V *Mother's Day, drinks dispenser, spokesperson:*

Some aspects of English Compounding

The last chapter of the thesis will deal with some aspects of compound formation in English, primarily the more general issue of defining 'compound' vs. 'phrase', and specifically the question of whether there are 'linking elements' or compound-internal inflections within English compounds. This latter topic will be discussed in the light of the findings which resulted from the previous two chapters on linking elements in German compounds.

Even though compounds have been discussed at length in the previous two chapters, it is only now that a definition for what a compound actually is becomes necessary. The issue of whether an item is a compound or a phrase does simply not arise in German to the same extent as it does in English (Marchand, 1969:26). As indicated in the previous chapters, inflection on the modifier is often a way of telling a compound from a phrase; compare *frische Milch* 'fresh milk' which is a phrase, with *Frischmilch* 'fresh milk' which is a compound. And while orthography is often seen as too primitive a medium to aid linguistic study in any way, it is also because of spelling conventions that it is always and immediately unambiguous in German which is a phrase and which is a compound. Compounds are spelled in one word¹ with a capital letter, phrases are spelled in two (or more words), with or without hyphen². It really is as simple as that. Speakers have clear intuitions about the orthography even of spontaneously produced compounds, and the orthographic treatment of compounds is as regular and productive as the process of compound formation itself - which explains the occurrence of definitions such as for example Marchand's (1969). In English however, spelling conventions are not as strict and therefore, as a means of distinguishing

¹ This 'criterion' even appears in definitions of compounds by German linguists, e.g. Henzen (1965) quoted in Marchand (1969:20): "... mehrstämmiger Ausdruck einer Begriffseinheit, der zusammengeschrieben wird." ('... multiple-stemmed expression of a sense unit, which is spelled in one word.')

² Note that hyphenisation in German is much rarer than in English.

one from the other, useless: “The difficulty ... is in no way cleared up by PE orthography. Regarding this point prevailing usage is little short of chaotic.” (Jespersen, 1965 (VI):136).

Section V.1 will sum up some of the main arguments that have been proposed to further the definition of compounds in English in the literature over the past hundred years. V.2 proposes an approach to the definition of compounds which would fit the facts as they appear now. V.3 discusses individual types of compounds which may be interpreted as having either inflection or ‘linking elements’ in the juncture position and V.4 discusses the topic of ‘linking elements’ in English compounds and considers the questions of whether there are any, and if so, whether they can at all be compared to the phenomenon of linking elements in German compounding.

V.1 English Compounds: Problems with the definition

The goal is the Theory of Everything, but Ponder would settle for the Theory of Something, and, late at night, when Hex appeared to be sulking, he despaired of even a Theory of Anything. (Terry Pratchett, *The Last Continent*)

Simplicity and aesthetics are nice criteria when it comes to setting up theories of any kind. However, trying to define English compounds in a simple and aesthetic fashion is impossible because of the inherent complexity of the data; nominal compounds for example are largely characterised by messy semantics and obscured meanings in combination with overwhelming productivity. Older or established compounds may have become fixed in a certain way that is arbitrary at best - for example, why should it be *garbage man* in American English, *binman* in British English, and why is **rubbish man* (examples from Ryder (1994)) an impossibility (at least with the established semantics) in any variation of English?

New compounds on the other hand seem to be entirely pragmatically determined, as well as being of an endocentric nature, i.e. the first element explains (or: defines more closely) the second one, while a few (notably the obscured ones) of the lexicalised forms are exocentric, i.e. referring to a “different external distribution class from the nuclear constituent or from both of the immediate constituents.” (Nida, 1946:94). Ryder (1994) for example discusses a made-up specimen, *bike-girl*, at length, merely illustrating how anyone can make up a new compound given a certain set of circumstances: Two people are talking about one of their neighbours without knowing her name, one names her the *bike-girl* because she leaves her bike at the bottom of the stairs, the other then knows who is being referred to. Of course, *bike-girl* could potentially mean all sorts of different things, depending on the situative context of speaker and hearer. Another difficulty is that sometimes one or both parts of a nominal compound denote certain qualities which are so prevalent that the construction of the compound, as well as its use, are determined by them. Alex Lascarides, in a 1999 lecture at Edinburgh University, described **blacksmith hammer* as ill-formed, because the *blacksmith* already semantically denotes *hammer* (and vice versa), so that *blacksmith's hammer*, which syntactically acknowledges and emphasises the connection, is the preferred form.

Nominal compounds are abundant in English. It is impressive to see to what length linguists will go purely in order to account for compounds, or even in the ‘simple’ attempt to define them. The number of criteria, rules and tests that are employed is overwhelming, and yet none of these, nor all of them combined, seem to yield an absolutely satisfactory result. Also, there seem to be no restrictions as to how many (and which) criteria may be employed in any given theory at any one time, which leads to very unscientific, random assumptions about the facts - rather than to an appropriate analysis of them. In the following review of literature on the subject of how to define compounds (as opposed to syntactic constructions with e.g. nominal modifiers), I shall consider approaches based on a single distinguishing

criterion, approaches that employ a combination of various criteria in order to achieve a distinction, as well as approaches that claim that there **cannot** be a distinction. The selection of literature is based on the variety as well as the novelty of the various approaches; the reason I chose to go quite far back in time is that I believe Hatcher's (1960:361) statement to be true: "It is sad that a linguist of today cannot go beyond a linguist of the nineteenth century; it is sadder still if his work is inferior to his predecessor's."

The following section will explore a variety of approaches which have been proposed over the past 100 years or so. It will start with earlier attempts and progress chronologically, by author. Whenever the issues of 'linking elements' is discussed by an author this will be pointed out and briefly examined. A more detailed discussion of this particular aspect of English compounds can be found in V.4. Note that I do not claim to offer a comprehensive study of all criteria which have ever been proposed with regard to furthering a distinction between compounds and phrases in English.

V.1.1 English Compounds: Attempts at definitions

"The transition from syntactical juxtaposition to true composition is very gradual; no sharp line of demarcation can be drawn between them." (Paul, 1888:371)

This section will discuss a variety of attempts at a definition of compounding, starting with Jespersen (1965) and Bloomfield (1933) and ending with Bauer (1998). The analysis by Bauer (1998) is also used to sum up all the various criteria which have been examined throughout, as this particular paper illustrates them and discusses the value of having such a wide range of criteria rather than just one or two of them.

The problem in finding an accurate distinction between compounds and phrases seems to have been recognised a long time ago, and with it also came the realisation that while one

criterion on its own, used to distinguish a phrase from a compound, was not enough, some of the criteria were also unreliable within themselves. Bloomfield observes in (1933: 227) that the linguist's understanding of semantics is insufficient to have a firm enough grasp of it in order to use it as a helpful tool: "... we cannot gauge meanings accurately enough; moreover, many a phrase is as specialized in meaning as any compound." Even stress, which is at that time frequently cited as one of the most exact and reliable criteria for the distinction, namely that compound stress in English (and German) (as well as in Danish, cf. Bauer, 1978a:91) is a heavy stress on the first element, e.g. 'ice , cream³ is a compound and 'ice 'cream is a phrase (Bloomfield, 1933:228) is on its own not a sufficient criterion either - e.g. ,head 'master.

Jespersen, writing in 1909, decides that "A compound may perhaps be provisionally defined as a combination of two or more words so as to function as one word, as a unit." (Jespersen, 1965: 134). Jespersen's attempt at a definition of compounds is initially motivated by semantics, and he emphasises the "conciseness" of compounds as opposed to phrases, thereby taking the opposite view of Bloomfield (1933:227). He poses the question of why we should use compounds at all, instead of free syntactic combinations of the same elements, and observes that "the merit of compounds lies in their conciseness, as compared with paraphrases following the usual syntactic rules ..." (p.137). However, the conclusion drawn from these observations is the same as Bloomfield's, namely that a definition based exclusively on semantics is insufficient. Jespersen notes the complexity and sheer number of possible 'semantic' relationships between compound parts, and deduces that "The analysis of the possible sense relations can never be exhaustive" (Jespersen, 1965:138). These relatively early findings are interesting with respect to later attempts e.g. by Ryder (1994) to base a definition of compounding on semantics alone; the ultimate failure of any such undertaking is not surprising with a view to the diversity of the data. What Jespersen points

³ This may only be valid for American English. Wells (1990) notes that in British English there is a preference for the stress pattern being reversed: , ice 'cream.

out quite rightly is that either option (to have few semantic (or case-) relations between compound parts and a large list of exceptions, or to have a large number of variations of possible semantic relations and a smaller list of exceptions) is little more than a - albeit elaborate - type of listing.

Jespersen observes two distinct (and contrary) diachronic developments of compounds in English. One is the preservation of the combining elements as separate words, thus emphasising the nature of the composition (p. 140). This frequently leads to the loss of compound stress, and to the change of the non-head element from a compound part to “approaching the status of an adjective” (p. 140), for example: *his personal and **party** interests*; *five **gold watches** and a silver one* etc. Arguably, these items may no longer be called compounds - but Jespersen points out the impossibility to distinguish between these (“dissolved or dissolvable compounds”) and ordinary compounds.

The other development is one whereby the unit of the composition is strengthened while the combining elements may lose some of their independent values (i.e. phonetic changes, loss of semantics etc.), for example⁴: *Lammas* < OE *hlaf mæsse* ‘loaf mass’, *lady* < OE *hlæfdige* ‘loaf-kneader’ (original semantics changed), *gospel* < *godspell* ‘good message’ (semantics of the second element lost), *cupboard*, *boatswain*, *Monday* (second element reduced to /dɪ/ and compound status obscured), *postman* (second element reduced to /mən/ and having acquired suffix status) etc. (see also Faiss (1981) below).

With regard to ‘linking elements’ in English compounds, Jespersen observes that the left hand member of a [[N] [N]] compound is generally uninflected regardless of plural semantics. He essentially takes the same stance as Bloomfield (1933:231), who argues⁵ that even though the linking elements are formally like inflectional affixes, it is not appropriate

⁴ from Jespersen, 1965: 141.

⁵ based on German examples alone!

to interpret them as such; he proposes that only derivational units enter into compounding and derivation, and that they are prevented *a priori* from having inflection attached to them.

Lees (1960, 1966, 1970) analyses compounds by means of a derivation from an underlying syntactic structure: “the compound is not merely derived from a sentence but is derived in context, i.e. is automatically embedded as a noun inside a sentence.” (Lees, 1966:5). He observes a range of grammatical relations between two parts of a compound, e.g. Subject - Predicate (*girl-friend*) or Object - Prepositional Object (*bull ring*) etc. The problem with such an analysis is that these underlying structures are largely arbitrary; they are proposed ad hoc (aiming at the finished product which is to be derived), and it is furthermore quite possible to propose more than one underlying sentence for each compound,

- e.g. *bike girl* - the girl who has a bike
 - the girl who is riding a bike
 - the girl who is leaning on a bike
 - ? the girly boy who cleans his bike all the time etc.

Lees (1966:5) does not share this view; in a reply to a paper by Marchand, he comments: “At one point Marchand is also concerned by the fact that a sentence and the compound derived from it are “syntagmas” with different functions - a noun cannot function in the same way as a whole sentence. I’m not sure I understand the nature or source of his concern.” Arguing against a sentence-based approach to the analysis of compounding, e.g. Allen (1980:12) observes that “There is no reason to suppose that a verbal element is present at any stage of the derivation of primary compounds⁶.” And while Lees (1970) proposes more semantically orientated underliers than in (1960), the basic problems with the derivation side of the analysis remain. The underlying NPs are now specified with underlying case relations (cf. Fillmore, 1968) of the kind Agent, Patient, Instrumental etc., however, again a complex deletion process is required to avoid underlying verbs to surface.

⁶ As opposed to ‘Verbal Nexus’ or ‘Synthetic Compounds’ which contain a deverbally derived element.

I consider this to be a big problem, particularly since the underlying verbs are more or less made up initially anyway, and there does not seem to be sufficient motivation for their existence in the first place.

Lees (1960:120) also joins the ranks of those who observe the inadequacies of stress as a distinguishing criterion, by citing the examples *Madison 'Avenue* vs. *'Madison Street* and *apple 'pie* vs. *'apple cake*: “All composites in *-street* and *-cake* are compounds, while all in *-avenue* and *-pie* are invariable nominal phrases.” A similar analysis is conducted in Chomsky and Halle (1968:369) on *Fifth 'Avenue* vs. *'Fifth Street*; they use readjustment rules to account for the different stress patterns.

Marchand (1969), in one of the most comprehensive studies on English compounding up to that point, emphasises the ‘psychological unit’ which a compound presents and the importance of an underlying concept which is isolated against other, much wider concepts such as ones which are encompassed in phrases (1969:22). Marchand classifies compounds into ‘verbal nexus’ (containing a verbal element, e.g. *draw bridge*) and ‘non-verbal nexus’ (e.g. *girl friend*), and also distinguishes between primary (e.g. *black bird*) and synthetic compounds (the latter are derivations from ‘verbal nexus’ compounds, e.g. *watch maker*) - this same distinction can subsequently also be found in the accounts of Roeper & Siegel (1978), Allen (1980) and Lieber (1983). Marchand lists all possible criteria, discarding some and noting that others are only applicable to certain types of compounds, and thus not very helpful overall. The main bulk of his classification rests on an analysis of underlying structure; specifically underlying grammatical relations pertaining to the head of the compound, e.g. the ‘subject’ type *shoemaker* ‘he makes shoes’ (1969:34) as opposed to the ‘object’ type *mincemeat* ‘the meat has been minced’, etc.

Berndt (1963:306), in a review of Marchand (1969) notes a very interesting contradiction: “Marchand says on p. 18 that ‘a syntactic group is always analysable as the additive sum of its elements’ and on p. 80 that ‘any syntactic group may have a meaning that is not the mere additive result of its constituents’. This sums up the difficulties of relying on semantic criteria alone in the on-going debate of nominal compounds versus nominal phrases.”

On the subject of inflection inside compounding, Marchand (1969:65) comments (citing *craftsman*, *driver’s seat* and *bull’s eye*) that “Historically speaking, the types are old genitive groups though in many cases the plural concept has also entered the pattern. It will be impossible to tell when exactly /s, z/ came to be regarded as a derivative element and when combinations of this group acquired compound status.” Marchand does not enter the debate on ‘linking elements’ at all.

Downing’s (1977) paper is based on an experiment in which new compounds are created. “The results indicate that the semantic relationships that hold between members of these compounds cannot be characterised in terms of a finite list of ‘appropriate compounding relationships’.” (Downing, 1977:810). Downing finds that pragmatic factors determine compound parts as well as the specific semantic relations they will have with each other in each specific case. Downing is also one of the first (since Jespersen) to note the potential futility of the task: “...I doubt that the dividing line between [[N] [N]] compounds and nominal phrases is always well-defined.”(1977:811)

Levi (1978) studies what she calls ‘complex nominals’: [[N] [N]] compounds (*apple cake*, *windmill*, *autumn rains*), nominalisations (*presidential refusal*, *constitutional amendment*, *film producer*) and ‘noun phrases with nonpredicating adjectives’ (*electric shock*, *electrical engineering*, *musical criticism*, *musical talent*). Levi draws a striking comparison between nominal compounds (a.) and constructions of ‘pseudo-adjective + noun’ (b.), where the

'adjective' "functions like a noun", i.e. is found in the position which in a. is occupied by the nominal modifier (p.4):

a. <i>language difficulties</i>	b. <i>linguistic difficulties</i>
<i>industry output</i>	<i>industrial output</i>
<i>drama criticism</i>	<i>dramatic criticism</i>
<i>ocean winds</i>	<i>oceanic winds</i>
<i>atom bomb</i>	<i>atomic bomb</i>

Her analysis is an attempt to prove that the examples in b. are only superficially distinct from the examples in a., and that in fact there is a nominal underlying structure for the first component of the construction in examples (b.). I will not go into a detailed criticism of her analysis; what is of great interest though is that Levi is one of the first to make it her working hypothesis that there is **no** distinction between compounds and phrases, and she proceeds to analyse both (or in her case, all three) groups as part of the same phenomenon.

However, Levi points out that her analysis applies only to endocentric constructions, and that exocentric complex nominals of any kind are inherently difficult to explain or generate. She basically excludes any combinations that are not susceptible to a literal interpretation (which she assumes to be learned, listed, and hence not productive).

Bauer (1978a) writes mainly on Danish endocentric nominal compounds, but much of what is described is of immediate relevance to the issue of linking elements both in English and in German. Bauer briefly discusses adjective + noun compounds, where the adjective does not decline (i.e. takes the form of the stem), and notes that this lack of declension shows that these instances are in fact compounds (1978:92). However, he goes on to say that this issue of inflection within compounds has to be treated as significantly different in [[N] [N]] compounds. In Danish nominal compounds, the first element is frequently morphologically singular even if it is semantically plural (cf. German *Buchladen*, English *book shop* - a shop

which by its very nature must contain more than one book), but this is not exclusively so. The same argument can apply to the appearance (or lack) of the linking element *-s-*, where Bauer observes that a deep structure ‘genitive’ does not necessarily surface, and a surface *s* does not necessarily mean ‘genitive’ semantically⁷.

Bauer also refers to the attempt to distinguish between ‘proper’ and ‘improper’ compounding (cf. chapter IV, specifically the discussion of Wilmanns (1896) and Fleischer (1974)), but concludes that this classification is no longer useful, because it is no longer possible to determine whether e.g. an *-s-* in the juncture position is originally due to an ‘improper’ compounding formation (i.e. is the genitive singular inflection) or not (1978a:96). He proposes that all compound formations in Danish (and German and modern English) should now be regarded as ‘proper’ compounds. In Danish, the linking elements that are available for the juncture position are *-s-* (which is the unmarked form), *-e-* (the only form where semantic reasons, i.e. plural semantics, can be traced), *-(e)n-*, and a “subtractive from” (subtracting *-e* or *-r*, and sometimes adding *-s-*, comparable to the German *Kirch-hof*-type examples).

Bauer (1978a:99) sums up the discussion of the linking elements in Danish compounds by saying that their appearance is determined by phonetic, morphological, semantic and vocabulary-based (native vs. non-native) triggers, and concludes that “one can’t give rules”. The proposed solution amounts to a system of listings: “The linking elements are lexically conditioned, that is that in the lexicon, along with any noun, is listed the form it takes when it becomes the first element of a compound.” (Bauer 1978a:102). This listing can be overridden by a compound which is itself listed as a whole item, and blocking restrictions (to avoid homonymy). While I think that the two conditions which override the ‘regular’

⁷ *Contra* Botha (1968:166) (on Afrikaans): “If we regard ‘genitive’ as a deep structure grammatical category - as Fillmore (1968:77) does - another possible hypothesis is that in the compounds in which the link phoneme /s/ forms part of the phonological representation of the specificans, the formative which occurs as this specificans is concatenated in the deep structure with the grammatical category ‘genitive’.”

listing are justified, I disagree with the primary requirement to list **all** nouns with their potential linking elements. As I hope to have shown for German (ch. IV above), the choice of linking element is entirely determined by the item's membership of inflectional class. However, since the English inflectional system does not lend itself to such an approach, it remains to be seen whether listing is the only possible solution for English. While it seems improbable that semantic criteria will be useful to account for compound formation as such (compare e.g. Hatcher's (1960) four semantic categories with Brekle's (1970) 100), they may be helpful at least by perhaps stipulating the insertion of linking elements.

Faiss (1981) distinguishes between compounds and phrases, listing a number of established criteria (stress, spelling, semantics, syntax), and calls the ones that do not seem to belong to either category "pseudo-compounds" (cf. also Marchand (1969:13)). He says that a phrase has a stress pattern of 'secondary - primary stress', while the compound may show vacillation in the stress pattern (Faiss, 1981: 133) - note, however, where this might lead to semantic ambiguity; cf. *'glass case* (compound) vs. *glass 'case* (phrase)⁸. The definition fails where a semantic restriction is imposed; it is not true to say generally that a compound is more restricted (in its scope of interpretation) than a phrase (cf. Bloomfield, 1933). Faiss also cites orthography as a useful criterion for English, stating that syntactic groups (1) are never hyphenated, (2) are never spelled in one word, and (3) never have capitalisation of initial letters (Faiss, 1981: 135) - but they may be 'pseudo-compounds'. The spelling is a relatively useful criterion in German⁹, but English spelling is too inconsistent in these instances to be of any value with respect to distinguishing compounds from phrases, cf. e.g. *this I'm-ready-to-leave posture*. Faiss's whole account uses traditional criteria to explain the difference between compounds and phrases, and he admits that the methods employed here

⁸ He also notes that inversion compounds (*Princess 'Royal*) and N + of + N compounds (*House of 'Lords*) defy vacillation.

⁹ German examples: *Wildbach* vs. *wilder Bach* 'wild brook', *Schwarzbrot* vs. *schwarzes Brot* 'pumpernickel', *Kaltluft* vs. *kalte Luft* 'cold air', *Frischmilch* vs. *frische Milch* 'fresh milk'.

do not suffice to catch all instances and it is necessary to use the term ‘pseudo-compound’ to group all left-overs together.

Thomas-Flinders (1983: 118-119) discusses at length the notion that inflection is not permissible within compounding, unless it is irregular inflection. The existence of apparently inflected forms in derived words in English is unpredictable and not rule-governed, and is specifically not semantically motivated - despite the fact that there are a number of examples which show plural inflection within the compound, combined with a plural interpretation of the first element: *feet-first*, *men-at-war*, *lice-infested*, *teeth-marks* vs. *tooth-less*, *-brush*, *-paste*, *-fairy*. The same problem is under discussion in Churma (1983), where it is again observed that in English nominal compounds the first element is usually formally singular, even if the idea is plural. Churma argues that this can be traced back to being a direct consequence of theories which maintain that uninflected stems are the only possible inputs to rules of compounding (cf. chapter IV, specifically the account of Wurzel (1970)). Churma (1983:52) investigates the very valid question whereby if the first element of a compound is inflectionless, how is it possible that it may be interpreted as plural. He goes further on to question examples such as *oatmeal* (**oat*) and *trouser-pocket* (**trouser*) where the A element would be ungrammatical if were to occur in isolation without the plural inflection. The basic solution on offer is almost a direct copy of Wurzel’s (1970) analysis - a uniform insertion of plural inflection which is subsequently deleted in compounding with the exception of irregular inflection and listed exceptions, so that the (underlying) plural meaning may be retained.

Sproat (1985:412) discusses inflection of¹⁰ and within nominal compounds using a wide range of examples; he is as far as I am aware the first linguist to positively relish the notion that not only does regular inflection appear within compounds, it may be semantically

¹⁰ E.g. differences of the kind (exocentric) *sabertooth* - *sabertooths* and (endocentric) *milk tooth* - *milk teeth*

driven and is, overall, a very ordinary and regular occurrence. This approach takes the discussion of inflection within compounding to a new level. Sproat (1985:419) mentions a number of examples which he 'admits to' having made up on the spot, e.g. *highrises commission*, equivalent to *Human services commission* or *parks commission*. The pure fact that it is possible to create such forms so readily suggests that there is something wrong with the statement that there **cannot** be inflection inside compounds, because, quite simply, there can be. Sproat furthermore argues that there is absolutely nothing phonologically or otherwise odd about these quite regular formations of plurals inside compounds (i.e. they do undergo e.g. epenthesis) - and refutes the claim that, whenever a regular plural affix occurs within a compound, this is highly exceptional and should therefore be listed on stratum I (1985:416). Rather, the phenomenon seems best captured by means of (hierarchical) exclusions; i.e. in a compound AB, the member A prefers singular over plural, but if there is plural, prefers irregular plural over regular plural affixation (1985:421). Put like this, the regular plural affixation within compounds appears in an adequate context: it is not a frequent occurrence, but it is not a completely unusual and exceptional occurrence either, at least not to the extent that it would require listing on stratum I¹¹.

As far as attempts at categorising compounds are concerned, Sproat (1985:209) makes extensive use of Case Grammar. In his analysis of synthetic compounds, he observes that a verbal head assigns case to its nominal complement (e.g. *car driver*), and emphasises that no synthetic compounds are formed with verbs which may be used ergatively, cf. **man-arriving*, **ship-sinking* (as in 'the ship sinks'), **star-rising* (examples Sproat, 1985:212).

¹¹ It is, however, important to keep in mind that Sproat (1985:74) also argues against the existence of a lexicon (in the sense that it is a separate word formation component of the grammar), and instead advocates the existence of a permanent lexicon which is a data structure containing information about stems, affixes and idiosyncrasies regarding composition: "... word-formation is actually split between the syntax and the phonology in that it is principles of syntax which determine the syntactic well-formedness of words, and principles of phonology which determine phonological well-formedness." (Sproat, 1985:2) Cf. also chapter I.

Ryder (1994), whose analysis is based entirely on semantic tests, assumes every kind of combination of two nouns to be a 'compound' and distinguishes between 'deictic compounds', 'novel compounds' and 'established compounds'. This is essentially the opposite stance to e.g. Bauer (1998) who argues that **no** [[N] [N]] combination could be called a compound because there is not sufficient evidence which could distinguish them from phrases. Ryder's thesis is very elaborate in that she tries to take all eventualities into consideration (accounting for not only the actual interpretation of any [[N] [N]] combination, but also for any potential one). In this respect, it is a lot closer to the facts than e.g. Levi (1978), who disregards anything exocentric *a priori*. However, the account ultimately fails, for two reasons: one, because semantics alone is insufficient evidence for the distinction of two separate categories, and two, because even within very elaborate semantic organisation such as is applied here, gaps are evident.

The issue as to how compounds should be defined and according to which criteria the definition should be formulated is seen as a matter of ongoing debate in ten Hacken (1997). Ten Hacken analyses all main criteria which have been proposed in the past, formulates numerous definitions for the various types of compounds, and finally has a number of tests which aim to ensure that all kinds of examples can be captured within this frame. Among these, there is the issue to which I shall return in some detail below, namely the question of linking elements and of whether or not these can or should be interpreted as inflection. What is under investigation is the "inflection of one of the parts of the compound that is unambiguously **not** inflection of the whole of the compound, and that is meaningful" (ten Hacken (1997:31)). Ten Hacken rejects such inflection as evidence for compoundhood. However, considering the in-depth analysis of linking elements in the two preceding chapters, there is ample evidence that most linking elements are indeed proper inflection; and this in turn may lead us to speculate that productive inflection within compounding can be seen as proof that (at least for German) compounding is to be found in the lexicon, and

furthermore, that it is an on-going and productive process, and not merely a data storage facility (as was suggested by Sproat (1985)).

It is therefore rather simplistic to solve matters concerning inflection along those lines; the data suggests that any approach to tackle this problem needs to be more aware of the exact surroundings of the linking elements as well as their function in individual cases. This is exemplified in the Italian data quoted by ten Hacken (1997:29f), where inflection of the compound as a whole may attach to the first, the last or both elements of the compound, and the very similar Latin examples in Matthews (1991:34-35) where inflection of compound elements and agreement between the parts are very much in evidence - and seen as sufficient reason for Matthews to say that the examples under consideration are in fact not compounds at all.

Ten Hacken (1997:31) also considers the issues of 'inflection' in English compounds, e.g. *programs coordinator* vs. *program coordinator*, where the semantics of the plural inflection is relevant. However, it is noted that in English the 'linking element' is not only a rare occurrence, but it is also in most cases semantically meaningful, and thus cannot be analysed along the same lines as the German linking element.

Wiese (1996b) casts a brief glance at 'phrasal compounds' of the kind *a slept-all-day look*, *an off-the-rack dress*. In a phrasal compound AB, A (= non-head) consists of a phrase with phrasal stress, while overall AB has initial, i.e. compound stress. Wiese strongly argues against an analysis that would involve a "recursion" from the syntax back into lexical compounding" (p.186), for two reasons. One, because it would not be "economical", and two, because such a solution would go against the spirit of the Lexicalist Hypothesis¹². What is suggested instead is that phrasal compounds - and all other kinds of compounds as well -

¹² *Strong lexicalist hypothesis*: Regularities for the WORD do not overlap with the regularities of the domain PHRASE. (Wiese, 1996b: 183)

should be accounted for in a 'quotation analysis': "In quotation, material from one domain (the quoted expression) is used and imbedded in some other domain (the matrix expression)" (Wiese, 1996b: 188). In essence this means that *along-the-wall ivy*¹³ is analysed in exactly the same way as e.g. *parks commission* - they are both interpreted as compounds, and both non-heads are interpreted as quotations of phrases. This offers a neat way out of the problem of having a regular plural inflection within a nominal compound; it is simply regarded as a 'quoted' phrase: "That is, a plural suffix induces a phrasal reading ..., whereas singular forms are preferentially treated as lexical compounds ..." (Wiese, 1996b: 189). I do not understand how a plural inflection on a noun can be seen to turn this noun into a phrase, specifically a phrase that is sufficiently "noteworthy" to be "quotable" in order to qualify for this analysis (p.189).

Bauer (1998) in a way sums up all that has gone before. The paper looks at some of the criteria that have been used in many of the approaches under discussion above (here only with respect to [[N] [N]] combinations) and concludes that there are not enough well-defined distinguishing criteria that differentiate nominal compounds from other (syntactic) [[N] [N]] constructions. Therefore, Bauer proposes that all combinations of two nouns in English should be viewed as variations of one construction (similarly to Levi (1978))- whether a morphological or syntactic one, is uncertain; "... but it should be noted that it is, in effect, a lack of evidence for the contrary position which leads to the conclusion that there is a single class, not positive evidence in its favour." (Bauer, 1998: 66).

Bauer's first criterion under consideration is listing; i.e. the difference between a compound and a syntactic construction with a nominal modifier is that the compound is listed in the mental lexicon as a lexeme, while the other is created as and when required. This criterion takes as its basis the assumption that all lexical items (and combinations thereof) are listed, and hence does not work - for the simple reason, that compounding is just as productive as

¹³ I fail to see how this could possibly be interpreted as a compound.

other kinds of word formation; and that any new product will not necessarily be stored immediately as a lexical entry. New words and compounds 'earn' the status of lexemes not by virtue of a one-off encounter, but by repeated encounters and use. Frequency in usage, (geographical) spreading of usage and lasting usage are the three main criteria for any neologism to become established as a lexical item proper. (Similarly, presumably, they may also lose this status, if they are no longer used.) Listing as a concept does not actually tell us anything about the status or otherwise of any item under consideration - and thus may be used only to represent speculations about the lexical status of an item, not, however, as a means to determine that status.

Bauer is also one of the few linguists now who are prepared to even consider orthography as a potentially viable means to distinguish words from phrases (cf. Faiss, 1981). In German, this criterion is one of the main reasons why the question of what is a compound and what is a phrase has not really been an issue; compounds are spelt in one word, with a capital letter (if they are nouns); and only few examples are hyphenated. The option of spelling a compound in two separate words is not available. Of course, English orthography (here: meaning whether or not words are spelt together, hyphenated or apart: *wordformation*, *word-formation* or *word formation*?¹⁴) is notoriously inconsistent in this respect, and offers little help with respect to the 'established' status of an item. It is not true to say that the more 'listed' or 'lexicalised' a compound has become, the more likely it is to be spelt in one word - this is only true, if the item in question also happens to be rather short. However, what seems to be at work here is more a general language specific tendency (cf. German *Kinderwagenvorhangnäherin* - where length does not seem to be a deterrent), rather than a sound linguistic principle.

Stress, as has been discussed repeatedly above, is also dismissed here as a viable option. To distinguish between a compound with stress on the first element (*'apple cake*) and a noun

¹⁴ Sproat (1985), for example, uses all three spelling variants in his text.

phrase with stress on the second element (*apple 'pie*) lacks the accuracy that this criterion requires in order to work satisfactorily. While it is true that the problem can be reduced to some extent if we assume that phrases are always end-stressed, while compounds may carry either fore- or end-stress, it is equally true to say that this criterion is relational, and not sufficient on its own. Bauer remarks on various attempts of correlating stress to semantic relations that albeit the correlations are by no means exact and coherent, “important trends have been noticed” (e.g. Ladd (1984), Liberman & Sproat (1992)). This observation is important inasmuch as it summarises succinctly the fate that all these criteria share: they all serve to formulate **tendencies** that both categories, compounds on one hand and NPs on the other, lean towards, without being able to discriminate rigorously and draw correct and non-violable borderlines between them.

The last three criteria under consideration in Bauer (1998) are syntactic tests, whether the first element in a compound may be syntactically isolated, whether compounds permit co-ordination, and whether the head in a phrase can be replaced by *one*. Examples like the cited “ So, I hear you are a real cat-lover. How many do you have now?” (Bauer, 1998:74, quoting an example from Ward et al (1991)) seem to suggest that it is possible in some cases (semantics permitting) to refer to the first N in a [[N] [N]] construction, irrespective of whether this is a compound or a phrase. I would like to agree with Bauer that therefore an analysis of this kind will do little to distinguish between compounds and NPs. Bauer further discusses examples where it is possible to interpret adjectival modification of the compound as that of the first element of this compound (something that ought not to be possible according to the Lexicalist Hypothesis), e.g. *Serious Fraud Office* or *instant noodle salad*. Such modification can thus not be assumed *a priori* to be a property of phrases alone.

It is also in this section that Bauer briefly considers plural inflection on the first element of a [[N] [N]] compound in English. This is dismissed as a distinguishing criterion, but other

aspects of Bauer's observations are more interesting: "In longer compounds, the <s> marking is sometimes used to show the immediate constituent structure in the compound. Contrast the attested distinction between *[[[British Council] jobs] file]* and *[British Council] [job file]* ... If the <s> can be used in this way, it suggests that plurality is not all that is at stake here ..." (1998:75). This is all that Bauer says about linking elements here, but it is interesting to note that questions beyond the 'inflection or no inflection' are taken into account at all. I will return to this topic in V.3.3 - V.3.5 below.

Having shown that, separately, all the criteria applied to the question of whether any given item is a compound or a phrase do not yield a reliable result, Bauer then demonstrates that not even if all criteria were to be correlated would we have a solution to the problem. In fact, only one set of criteria seems to him to be relevant for making the distinction between compounds and phrases: "It has been suggested that what the criteria really represent is two distinct things: first there are those criteria which say something about the degree of lexicalization; second there are those criteria which say something about the degree of syntactic availability of the individual elements in the collocation. The first set of these ought not to be relevant to drawing a distinction between morphology and syntax, since the lexicalized/nonlexicalized distinction is orthogonal to the morphology/syntax one. The second set, though, looks as though it should be relevant." (Bauer, 1998:85). Bauer's conclusion is that there is not enough evidence to suggest that there is a distinction to be made, and that perhaps a better approach to the problem would be to regard all such formations of the type *[[N] [N]]* as one kind.

V.2 A different proposal (within LP)

"... words are peculiar, not only in that not all of those that should exist actually do, but also in that those which do exist do not always mean what they are supposed to mean, or even look like what they are supposed to look like.

Words, once formed, persist and change; they take on idiosyncrasies, with the result that they are soon no longer generable by a simple algorithm of any generality.” (Aronoff, 1976:18)

The main problem with compounds is that they are words, and that they exhibit the same characteristics and behaviour as words. The outcome of the discussion in the previous section was that there is insufficient evidence to entirely prove that there is a fundamental distinction between compounds and phrases. Interestingly, Bauer (1998) sums up his findings to this effect, and draws the conclusion that since there is not enough evidence **for** the distinction, there is no distinction, and that compounds and phrases are the same. While I agree with the summary that there is not enough evidence for such a distinction, I disagree with the conclusion drawn from it: I think it is much more likely that what the findings suggest is that to look for this distinction in the first place is the wrong thing to do. This is not quite the same as saying that compounds and phrases are one and the same; it is merely giving in to the facts that linguistic analysis frequently runs into squishy borders, where mathematically accurate and analytically sound methods appear to be out of place.

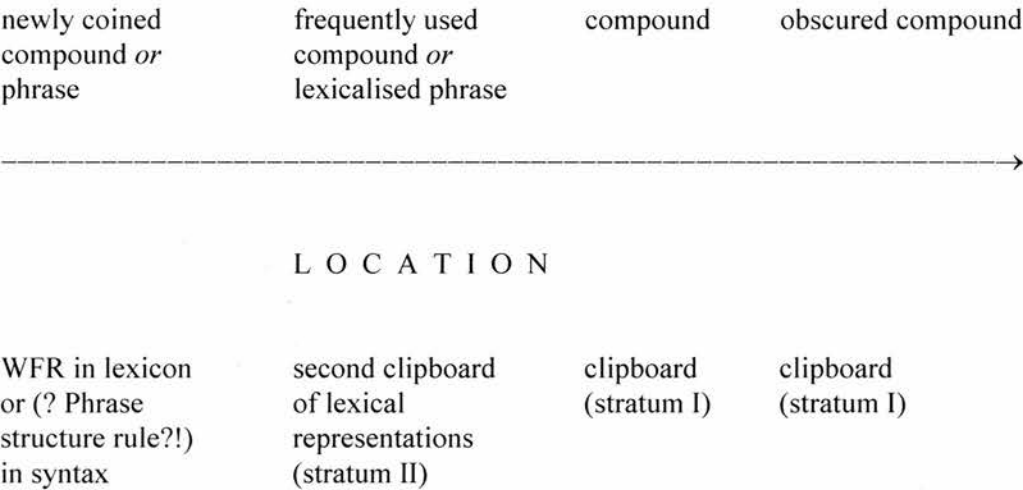
This means that what is being proposed in this section will not further the debate of establishing a distinction between compounds and phrases, it will merely introduce the idea that there may not be a distinction, but something which rather resembles a squish or a hierarchy of some kind. This is, of course, not useful at all for the following categorisation of compound types, but it appears to me to be much closer to the reality.

Let us therefore suppose that there is some kind of a spectrum, with compounds on one, phrases (more or less lexicalised) on the other side - and a lot of items in between that are in the process of making the transition between either end, e.g. from being a frequently used lexicalised phrase to being a ‘unit’ of meaning, i.e. functioning as one item, a compound. With respect to listedness (which is undoubtedly a characteristic of established compounds), it has been observed that frequency in usage, (geographical) spreading of usage and lasting

usage are the three main criteria for any novel compound-like formation to become established as a lexical item (Bauer, 1998).

The main points of the spectrum therefore ought to be correlated to these criteria: **(1) time** (how long has the item been in use?), **(2) frequency** (how often is it used?), **(3) space**¹⁵ (is the item's use restricted to an area / a certain group of people?).

Graph (a)



This perception of the data is closely linked to proposals made by Ross (1973), Bybee (1985) and Di Sciullo and Williams (1987:14) who have a hierarchy of listedness:

<i>Hierarchy of definition</i>	<i>Hierarchy of listedness</i>
morpheme	all the morphemes are listed
word	'most' of the words are listed
compound	many of the compounds are listed

¹⁵ This last criterion is not as important as the first two; there are plenty of 'specialised' lexical items e.g. maritime vocabulary - that **are** lexical items without being widely known.

phrase	some of the phrases are listed
sentence	four or five of the sentences are listed

Even though there is room for improvement with regard to this hierarchy (the “ ‘most’ ” is not very helpful; and “four or five of the sentences” seems to be a much too small number), it appears that **because** this hierarchy is so vague, it is much more accurate in its vagueness than stricter limitations could be; and it also formulates the problem in distinguishing phrases and compounds very succinctly: it is a difference of “many” and “some”, never of “all”.

Diachronic developments play an important role: phrases may become lexicalised and even acquire compound stress, while compound parts (i.e. originally separate words¹⁶) can deteriorate and turn into affixes (e.g. *postman* /-man/ → /-mən/). Any new creation may become an obscured compound over time, with the original form and meaning of the components unrecognisable; cf. *daisy*, *lord*; or, still vaguely transparent, *breakfast* cf. Faiss (1978). The development in the other direction, i.e. for a compound to disintegrate into a phrase, does not seem to me to be occurring, though theoretically I can see no reason why it should not be possible.

As can be seen in graph (a), I am also proposing an addition to the structure of the lexicon (as it is seen in LP), namely that of a second clipboard of lexical representations which is incorporated into stratum II (for English). A ‘clipboard’ is simply a place where items are stored without being analysed in any way, i.e. not stripped of affixes or otherwise dissected into components, nor constructed out of components. As the name suggests, the clipboard is easily and quickly accessible, so that frequently used forms may be stored there for effortless and ready access (clipboard on stratum I), and newly acquired forms may be

¹⁶ cf. Faiss (1992:59ff) on modE suffixes that were free morphemes in OE, e.g. *dōm* (*cynedōm* ‘kingdom’), *full* (*cearfull* ‘careful’), *hād* (*cīldhād* ‘childhood’), *scipe* (*weorþscipe* ‘worship’) etc.

stored there quickly, even if only temporarily (clipboard on stratum II). The clipboard is smaller than the general storage, and the limited space may account for speed of access to frequently used forms (clipboard on the final stratum). If storage of complex forms on stratum I is assumed to be located on the clipboard, rather than, e.g. the general storage of all roots, this may also account for the quicker retrieval of irregular forms, compared to the retrieval times of regular, but infrequently used forms which may have to be produced online (cf. I.5).

A second clipboard of lexical representations could also account for a variety of phenomena relating to language acquisition. For example, if a new word is learnt (or, to be more precise, its exact meaning is grasped) by an adult, it often appears that this new lexical item seems to be encountered more frequently. What in fact happens is perhaps that the item is now **recognised** for what it is, rather than just by-passed as something vaguely familiar (but not comprehended) or as something completely new and uninterpretable. This new word, which is at its first appearance stored on the clipboard, will eventually be associated with its full specifications, i.e. its pronunciation, its spelling, its meaning (semantics), its application (syntax) and its connotations ((social) register). The more of these specifications are learnt, the more familiar the item will become - until it eventually moves further up into the lexicon, having now become established as a usable item of the speaker's lexicon. This may also go some way to explain how e.g. within the process of acquiring a foreign language, items of vocabulary are learnt; the more frequently they are encountered, the more likely it is that they will eventually be remembered. The process may presumably also be reversed: an item which is not sufficiently re-affirmed may be lost and therefore 'de-lexicalised'; however, this seems to be more likely to occur with newly acquired forms rather than well established ones. It is improbable that once the speaker is reasonably familiar with a word it will be lost, even though it may not be used for a very long period of time.

I am aware of the fact that in order to propose this model seriously, I would need to present a formal account based on extensive psycholinguistic evidence which would support the theory. Of particular interest would be various types of language acquisition, for example the study of a language which is learnt by a young child, but subsequently not used at all; having been 'dormant' for a number of years, how much, if any, of that language can be retrieved? However, as was already indicated in the first chapter, to do so would go beyond the bounds of this thesis, and the proposal is included here merely out of interest, as an aside.

Similarly, a second clipboard may explicate the phenomenon which can often be observed in children who will reinforce a newly encountered word by frequency of usage - the item has to be more readily available than other, already learnt words, because it occurs much more frequently (often irrespective of whether it is appropriate or not), until it is fixed in the child's vocabulary.

The clipboard (and the related processes of how new items reach the lexicon) may also serve to explain the fact that newly coined items do not seem to receive irregular inflection. Kiparsky (1982(a)) e.g. observes that verbs which have been derived from nominal compounds do not have irregular inflection (*grandstand*_{Noun} → *to grandstand*_{Verb}; past tense **grandstood*). Kiparsky explains this by way of stratification; in his three-strata lexicon, irregular inflection is situated on stratum I, compounding is taking place on stratum II, and regular inflection is on the third stratum - therefore irregular inflection cannot apply after compounding. However, as Sproat (1985: 372) points out, this phenomenon can be explained irrespective of stratification; irregular inflection must be listed with any item (the 'clipboard' function of stratum I), and newly coined verbs never have irregular inflection

(regardless of their source or formation) - they enter the lexicon from the clipboard and never pass through the word formation part of stratum I¹⁷.

In chapter I, I have outlined the necessity for having something resembling a clipboard on stratum I where complex items are stored as such, as well as given independent motivation for the existence of a similar storage facility on the last stratum; the clipboard of lexical representations is such a storage facility, but has a very different function to that of the clipboard. (1) The clipboard is fed by the lexicon. This means, it allows for brand new creations (i.e. novel words created on either stratum) to be stored in a preliminary way. (2) The clipboard is also fed by the syntax. This is important and new as far as the theory of Lexical Phonology is concerned; it has so far been assumed to work as a one-way system (if we disregard attempts to change this which failed as spectacularly as e.g. Mohanan's (1986) 'loop').

Which of the forms thus stored on the clipboard will eventually be stored as lexical items within the lexicon (i.e. on the clipboard of stratum I) will be decided over time, depending on the individual speaker's use of the form, e.g. whether a novel form is used frequently or whether the creation was just a one-off occurrence. "Thus it cannot be the case ... that only semantically obscured 'lexicalized' compounds for example are listed in the lexicon, since even if the meaning of a particular compound is predictable from its components, the existence of the compound is not, and that fact must be registered by listing it in the lexicon." (Starosta 1988:93)

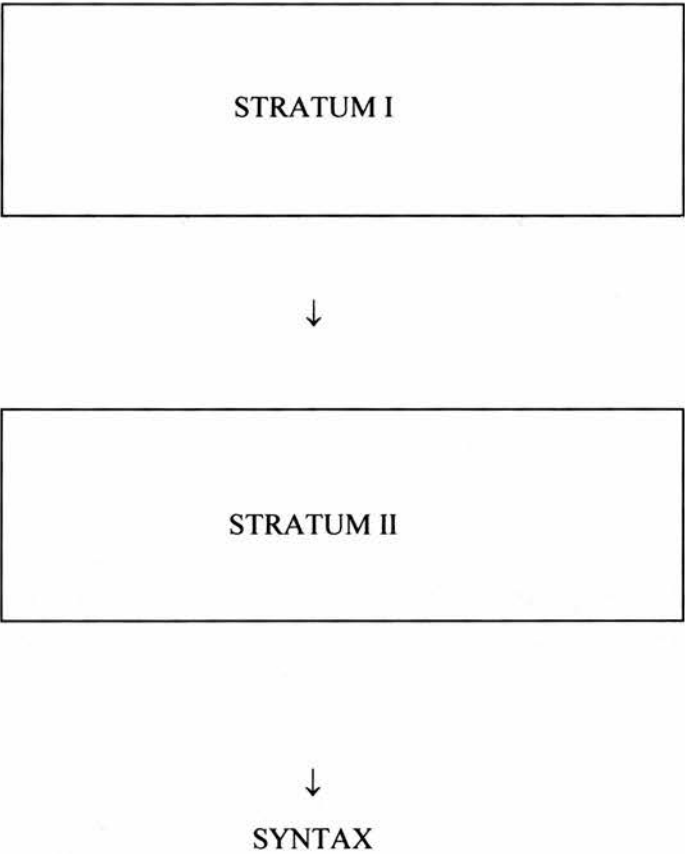
The model of the lexicon which is thus amended may be helpful in accounting for several phenomena:

¹⁷ This may cause difficulties if novel items are to receive irregular stress - unless they are acquired with that irregular stress already in place.

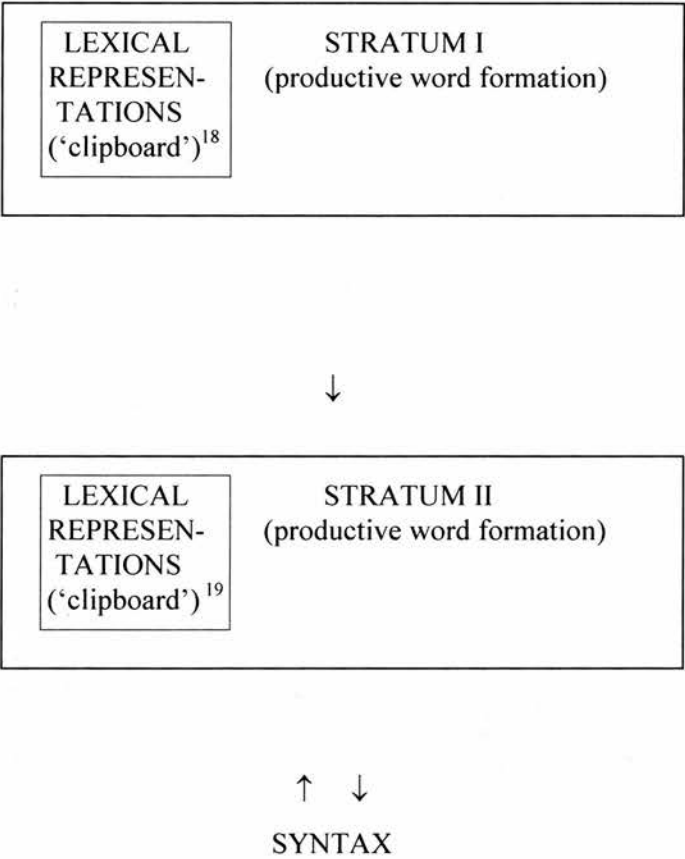
- many aspects of language acquisition; how new words are stored and become part of a speaker's lexicon over time.
- how phrases may become lexicalised and turn into compounds
- how compound parts deteriorate and turn into affixes
- how compounds may become obscured over time and turn into one unanalysable item

The following two graphics show the model of the lexicon; graph (b) as it is traditionally assumed in LP (note how the syntax does not feed at all into the lexicon), and graph (c) as it may appear if the lexicon is amended with the clipboard on stratum I and a clipboard of lexical representations after stratum II. It is probably true to say that to some extent the change also now incorporates a diachronic aspect of the lexicon, which was not catered for previously. It is a very limited diachronic aspect, though - the whole model does not seek to incorporate changes in the language over time **overall**, but rather the minute, yet undeniable changes that occur in any adult speaker's lexicon. Nobody's storage of words, no matter what the model, is static; new items are added and other, unused ones forgotten. Traditionally, accounts of the mental lexicon tend not to incorporate such ongoing, and yet, "As we have seen there are few limits on the formation of productive compounds, and a range of meanings is available. But there is great pressure for the compound to become 'lexicalised' - that is, to take on a specific, more or less idiosyncratic meaning. Then the internal structure begins to disintegrate and phonological disturbances occur." (Allen, 1980:26).

Graph (b)



Graph (c)



¹⁸ The clipboard on stratum I stores forms, including morphologically complex forms, as simplex items.

¹⁹ The clipboard on stratum II also stores possibly morphologically complex forms; the difference is that these items are either used frequently or have been acquired recently. If or how items that arrive on this clipboard would be allowed to enter the clipboard on stratum I is a matter of further research, and a topic which is too far removed from the main concerns of this chapter.

V.3. Elements in the juncture position of [[N] __ [N]] compounds in English

“From the morphological point of view there are two things to be observed in regard to a compound word; in the first place, the appearance of the elements, in the second place, their mutual order.

In reference to the morphological appearance of the elements, interest attaches well nigh exclusively to the *composition joint*.” (Bergsten, 1911:25)

The following sections will examine examples of English compounds which have morphological or phonological material in the juncture position between the first and the second part of a compound. V.3.1 offers a brief introduction, V.3.2 - V.3.3 examine the various possibilities for an occurrence of *-s-* in the juncture of [[N] __ [N]], V.3.4 discusses a range of ‘linking elements’ occurring in [[V] __ [N]] (compared to chapter III). Based on the discussion of the data, V.3.5 then addresses the question of whether or not there is such a thing as a ‘linking element’ inside English compounds (in contrast to the German findings of chapters III and IV).

V.3.1 [[N] s [N]]: Introduction

As has been shown in chapter IV with respect to German compounds, *-s* in the juncture position of a [[N] __ [N]] compound is more frequently associated with genitive semantics, and is positively banned from appearing in that position if the first noun’s nominative plural is *-s* as well. Overall, *-s* in German morphology generally is more likely to ‘mean’ genitive case, rather than nominative plural. This situation may reasonably be expected to be different in English, mainly because the *-s* affix here is the regular, as well as the most frequent, nominative plural affix of the language. *-s* in English however is also the genitive (singular as well as plural) inflectional affix, and thus a confusion may easily arise. In the following, a range of examples will be surveyed, and an attempt made to categorise *-s-* in the juncture as either genitive singular / plural or nominative plural inflection. (*-s-* linking elements which do not fit in any of the categories will be mentioned here, and revisited in V.3.5). As Bergsten (1911:74) notes:

“It is often attended with considerable difficulty to settle in MnE [modern English] whether an s-form is to be regarded as a plur. common or as a genitive (sing. or plur.), by reason of the coincidence in pronunciation. In those cases when the sole criterion existing, the sense, leaves us in the lurch, through its allowing of the form to be construed either way, no certain assumptions can be made; yet, it is not infrequently possible, by means of an analogical inference, to form an opinion which is very likely to be true.”

V.3.2 [[N] -s_{Gen} [N]]

Bergsten (1911) argues that -s- in English compounds is only permissible if it has genitive semantics; if it is a plural, it will eventually be deleted (presumably to avoid ambiguities). Aside from Bergsten’s account, I have not found any attempt of an analysis of juncture elements in English [[N] __ [N]] compounds in any depth. The majority of approaches have briefly looked at the possibility of whether or not the elements in the juncture position between the two parts of a compound can be interpreted as inflections. Subsequently most of these approaches have decided that inflection inside derivation is not permissible (and hence will not be interpreted as such). The current analysis benefits from other works which have dealt with the linking elements in German, where the distinction between linking element and inflection within a compound seemed not only appropriate, but necessary, to account for the many forms and their distribution.

a. genitive: *driver’s licence, cow’s milk, beeswax, lambswool; Mother’s Day, Valentine’s Day, April Fool’s Day, bridesmaid, writer’s block, author’s fee, child’s play, widow’s pension, Parkinson’s disease, Jehovah’s witness* (vs. e.g. non-lexicalised *Henry’s witness*), *Planck’s constant / Planck constant*²⁰, *master’s degree, devil’s advocate, traveller’s cheque / traveller cheque; sportscar, sportswear* (linking element?); *All Saints’ Day, All Souls’ Day, ladies’ room, men’s room* (genitive plural)

²⁰ Ruszkiewicz (1997:146) argues that there is no difference between *Planck’s constant* and *Planck constant* - the genitive marker is merely “an extension on the left hand stem.”

b. exocentric: *Adam's apple*, *Achilles' heel*, *athlete's foot* *frogsmouth*, *Parson's nose*, *monkshood*, *hornet's nest*, *baker's dozen*, *widow's peak*, *fool's errand*, *fool's gold*; *lady's finger* (endocentric, phrase) / *lady finger* (exocentric, compound)?

Both groups a. and b. visibly (i.e. grammatically, via the inflectional affix) and semantically display the genitive case; it seems illogical and futile to argue otherwise. It is, however, questionable whether or not this phenomenon on the whole is still particularly productive in PDE. I will return to this question in V.3.3 below where *-s_{pl}* is discussed; there, a wider range of more recent (i.e. less lexicalised) examples is available.

c. *swordsman*, *statesman*, *hunter*, *craftsman*, *draftsman* / *draughtsman* / *draughtman* (affix); *spokesman* (linking element!)

An *-s-* link which is not, nor ever could have been, a genitive, i.e. a true linking element, can be found in a very small number of examples only, e.g. *spokesman*, *harpsichord*.

Group c. is not productive in PDE any longer (Marchand, 1969:67), and it probably ceased to be productive in the 19th century; however, some compounds which were coined then still survive. They need no longer be transparent (grammatically and/or semantically) and require complete entry listing.

Bergsten (1911:114) also discusses examples in *-man*, e.g.

kinsman < OE *cynnes mann*
townsman < OE *túnes mann*
craftsman < OE *craftys mann*

He claims that for the majority of cases like these, the *-s-* was originally genitive singular inflection, but the vast majority of examples of this kind “have now got it by analogy” (p.114): “A consequence of this is that this group cannot be said to form genitival compounds in the proper sense of the term; i.e. such where the first element is felt to be in

the genitive case: the *s* is rather to be put on a par with that in German *Regierungsrat*, that is to say, it is a connecting consonant ...” Bergsten goes further, and compares the English data with the German phenomenon on the whole: “In the use of connecting *s*, MnE [modern English] differs from Modern German and Swedish, in which languages this connective has become very common. In English, it is almost only within the group now under consideration that the *s* has developed this character” (Bergsten, 1911: 115) e.g. *spokesman*, *sportsman* (which may be plural), *swordsman* < ME *swerdman*; *draught(s)man*.

However, even if this last group of data is discarded on grounds of lexicalisation, the question of what exactly the status of the *-s-* in the juncture position of all other examples actually is still remains. Much of the problem regarding inflectional affixes inside English compounds, and genitive inflection in particular, seems to reach further than just whether or not an affix inside a compound should be permissible in principle.

V.3.3 [[N] -s_{Pl} [N]]

While there was no compounding at all involving a first element in the plural in Old English, modern English has progressively taken plural compounding on board. But while plural inflection within compounds is now a possibility (though there is much debate if regular plural inflection ought to be ‘allowed’), it is by no means a regular occurrence, and must still be regarded as somewhat exceptional. The comparison with German works here very well; even though in German, there is not an exact one-to-one correspondence between plural semantics and a visible plural inflection within a compound, *both* plural affixes and plural semantics can be encountered quite frequently. This, it has to be emphasised, is not the case in English; and while some plural compounding occurs, it is not what might be

called 'productive'. Consequently, the range of examples extends from e.g. *Standard Novels Edition* (Bergsten, 1911) to *systems analyst*²¹ (Hammond (1984)).

a. regular plural affix (**not** *plurale tantum*) attaching to A, with plural semantics: *works department, reservations desk, inventions exhibition, industries commission, boy scouts movement, jobs programme, crimes act, trades council, parks department, parts department, human subjects committee, reservations desk, ratings book*; from Selkirk (1982:52): *parks commissioner, arms merchant, arms race* (see below; *plurale tantum*), *buildings inspector, sales receipt, parts distributor, weapons analysis*; from Kiparsky (1982b:131) *a heads-up policy, a hands-off policy, excess profits tax, the save-the-whales campaign* (more a phrase than a compound?)

A possible generalisation which may be applied to the examples of this group is that if the A element in a compound [AB] is an abstract (non-count) noun upon which a count interpretation is imposed, then A will take the plural inflection -s. This accounts for the wide range of e.g. *admissions-, departures-, promotions-, innovations-, publications-* etc. types of examples, but not really for the (concrete noun) *parks-, parts-, jobs-* types. On the other hand, perhaps this generalisation is to be made based on the semantics of the B element: Considering these kinds of examples, and the last four by Kiparsky in particular, it is now much more evident why Wiese (1996b) would have wanted to propose a 'quotation' analysis (see V.1): such an analysis acknowledges the increased likelihood of the B element triggering -s, if the B element is e.g. *-board, -committee, -office* etc., which deal with (countable) events. A similar observation is also made by Bergsten (1911:96), who observes that all compounds which show regular plural inflection between A and B end in '-tax', '-law', '-act', '-bill' etc. In effect this means that many of the words which show regular plural affixation precede a certain type of vocabulary, somewhat official sounding, and

²¹ It has been observed with particular reference to *systems analyst* that the -s plural inflection occurs mainly with idiosyncratic meaning; *systems* here can **only** refer to computer systems. (Sproat (1985:415)).

‘name’-like (in the sense of ‘title’). The temptation to write them with capital letters is also undeniable.

A much more indepth survey of data than is offered here would undoubtedly reveal much more comprehensive insights into the possibilities of formations of this type; furthermore, a study into well-formedness judgements would yield interesting results, in that e.g. **shoesmaker* would be considered ill-formed, while *incidents officer* would presumably be deemed well-formed. It seems that the more ‘formal’ and ‘official’ sounding formations are acceptable with the -s, and some may even be preferable that way (cf. ? *incident officer*).

b. plurale tantum: *overseas committee, clothes dryer, clothes brush, Arts Faculty, honours list, alms giving, amends making, oddsmaker, Humanities Department, arms race, Thanksgiving, gallows bird, news agent, oddsmaker, customs officer, savings account, systems analyst, draughtsman/draftsman/draughtman, sales book*; also: *painstaking*

Bergsten (1911:93) observes: “... in plur. tant. proper, i.e. such as are not at all used in sing., the ending regularly drops, whereas in those that are plur. tant. in a specific sense only it is just as regularly kept” i.e. *trouser pocket* vs. *savings account*. This claim can be substantiated by a range of examples involving pluralia tantum in both compounds and phrases, see examples in c. below. It is also possible that a range of blocking effects occur, which forbid e.g. **Art Faculty* or **arm race* on the grounds that they would mean something different (cf. Giegerich, forthcoming), and **clothe dryer* because the A element might be the verb.

c. phrase with plurale tantum as A element: *fireworks display*

but cf.: *oatmeal, trouserpocket, spectacle case* (**oat*, **trouser*, **spectacle* (‘glasses’)), *Threepenny Opera, three mile radius, five pint drinker* (phrases)

d. irregular plural inflection: *teeth-marks*; (not [[N][N]]:) *mice-infested*, *feet-first*

Kiparsky (1982b:137f.) notes that irregular plural inflection in compounds is acceptable, while regular plural is not, compare

<i>teeth marks</i>	vs.	* <i>claws marks</i>
<i>lice-infested</i>	vs.	* <i>rats infested</i>

A number of psycholinguistic experiments have been conducted in order to establish whether this claim, which is initially only made for theory-internal reasons²², can be substantiated beyond the line of argumentation stemming from LP. A study by Gordon (1985), based on productivity experiments with children, had some significant, if unsurprising results. The children's task was to create 'novel' compounds, with a plural meaning attached to the first element of the compound; the choices of A elements involved examples with both regular and irregular plural formation. The children did not place any regular plural affixation at all in the juncture position between the two compound elements even though plural semantics were particularly requested, but **invariably** placed irregular plural affixation there (again, however, only if prompted to do so). Semantic necessity for a plural interpretation of the A element of the compound was the *conditio sine qua non* for the insertion of plural inflection; the only kind of inflection that was sensitive to the trigger, however, was irregular inflection.

The same results (for German) were discovered by e.g. Clahsen et. al. (1992, 1995). Another study of a similar kind by Alegre and Gordon (1996) resulted in proving that regular plural affixation was acceptable in compounds, provided it attached to an A element which was clearly a **phrase**, thus making e.g. [[red rats] eater] acceptable, and not *[red [rats eater]]. It would appear, therefore, that all psycholinguistic evidence from a range of tests affirms the

²² Regular inflection is said to be situated on a later stratum than compounding, and hence has no access to compound-internal structure.

conclusion that irregular inflection is acceptable within compounding, while regular inflection is less so.

There are obviously a number of examples where the regular plural inflection occurs within a compound in English, which also show that the first element to which the plural inflection attaches is also **semantically** a plural: *companies directory*, *publications list*, *works department*, *drinks dispenser* vs. *drink dispenser* (which would offer only one kind of drink, e.g. a water fountain). I think that (meaningful) plural inflection **can** be found in English compounds, but that its appearance is limited - perhaps to cases where N_1 can have **either** abstract **or** count interpretation, and where in the compound the plural of the count analysis is crucial to the interpretation; cf. Giegerich (forthcoming) on *departures board* vs. *departure lounge*.

Chapman (1995a,b) argues that the overall issue is not so much one of whether e.g. regular plural inflection *is allowed to* occur inside compounding, but rather one of “perceptual salience”, a much more general concept which also happens to have consequences for the kind of inflection permissible in compounds (among other things). The two most important criteria which lead to any item being ‘perceptually salient’ are firstly the transparency of the semantic relations between the base and the derivative form, and secondly the derivative being uniformly marked. Semantic transparency is evident for example whenever inflectional affixes attach. An inflection does not semantically ‘remove’ the inflected form from the base; *walk* is not that different in meaning from *walk-s*, or *dog* from *dog-s*. The original semantics is retained, regardless of the inflectional affixes. Contrary to this, there is a range of derivational affixes which can cause a substantial change to the base form to which they attach, compare e.g. the semantic difference between *home* and *homeless*.

The second parameter depends on whether or not the “formal means used to signal the semantic opposition in question” (Chapman, 1995a:2) are uniform and transparent. This is the case in the plural affixation for English, for example: the event ‘plural’ is signalled by the attachment of the affix *-s* for the vast majority of words (with very few marked exceptions, zero or *-en*). In German, on the other hand, there is a rather larger amount of different affixes available which all signal ‘plural’ semantics (*-en*, *-er*, *-e*, etc. with or without umlaut), and the relationship between the meaning ‘plural’ and any one of these affixes is not uniform or transparent to the same degree as it is in English between ‘plural’ and ‘*-s*’.

Ideally however, this transparency works both ways; not only should one morphological event (e.g. pluralisation) be expressed only by one marker, but this marker should also exclusively be used to express just this one morphological event, and not others. In the example of *-s* for English plurals, an *-s* affix is not unambiguously used for pluralisation alone, but also for genitive singular, genitive plural (or III Person Present Tense) inflection.

‘Perceptual salience’ is a very useful, albeit not new²³, way of interpreting the data. I would like to put this concept forward as a potential explanation why *-s-* in English seems to be associated more frequently with the Gen. Sg. **in compounding** - and use this to account for the fact that even though a linking element (or inflection) ‘meaning’ plural is possible, in the majority of cases it seems to be avoided. If the *-s-* in the link position can somehow be found to be associated more frequently, and more naturally, with genitive semantics, this could be the reason for why an *-s-* meaning plural **in the same environment** is so unpopular; or, as Chapman (1995b:179) puts it “... this difference in salience may account for the fact that noun plurals in English do not feed derivation and compounding to the same extent as German and Dutch plurals do. In other words it is the relative degree of perceptual salience,

²³ cf. Humboldt’s Universal of ‘One Form, One Meaning’, which is essentially the same.

and not the distinction between ‘regular’ and ‘irregular’ inflection, that determines whether an inflectional category can serve as input to word formation.”

V.3.4 [[V] __ [N]]

In Marchand (1969:19) both *whetstone* and *writing table* are classified as ‘AB is B’, verbal nexus compounds whose verbal element is in the determinant (the A element) as opposed to the determinatum (the B element; as e.g. in *ballet dancer*). Again, the issues arising from the data of [[V] [N]] compounds in English is quite different from the discussion of the German data in ch. III; for the German data the question was exactly what the status of *-e-* in the juncture position could be; English does not have this linking element, but instead has a range of others, with different functions attached to them.

The amount of compounds in English which have a verb as the first element, but no inflection (or derivation) attached to it, is rather small, cf.

- a. endocentric: *driftwood* (intrans), *callgirl*, *whetstone*, *drawbridge* (trans), *rattle-snake*, *grind stone*, *go-cart*, *treadmill*, *searchlight*, *playboy*, *mince meat*
- b. exocentric: *breakwater*, *pickpocket*, *cry-baby*
- c. endocentric, affixed²⁴: *plowman*, *workman*; exocentric, affixed: *hangman* (the game)

The most productive kind of [[V] __ [N]] compound in English is the one showing *-ing*²⁵ in the juncture position; Marchand (1969:69) observes that while there are some compounds in OE which look as though they are formed in this way, “none of the words used today are older than Middle English.”

- d. (animate) *hunting dog*, *dancing queen*, *humming bird*, *mocking bird*

²⁴ In Marchand (1969) *-man* is considered to be an affix rather than a compound part, because it no longer possesses the full vowel, and instead has degenerated into /mən/.

²⁵ Not the *-ing* found in *flooring*, *lettering* etc..

e. (LOC) *living room, drawing room, dining room, playing field, hunting ground, landing pier, parking lot, shopping centre, filling station, dwelling house, hiding place*

f. (OBJ) *writing paper, baking powder, washing machine, cooking butter, clotting agent, laughing gas, sleeping pill, sneezing powder, marching band, looking glass, chewing gum, knitting pin, cooking apple, drinking water, spending money, blotting paper, carving knife, looking glass, magnifying glass, racing car, tuning fork*

g. *closing time, freezing point, whooping cough, teaching profession, Boxing Day* (linking element! - see below)

-ing is particularly interesting where there is no matching verb while the formation is clearly that of an action noun; e.g. “*Boxing-day* is the name of a day when servants and others “expect to receive a Christmas box”. As ‘to box’ does not occur in the sense of ‘to confer or to receive boxes’ the first member cannot directly suggest the verb” (Bergsten, 1911:59). Ditto *fielding piece, dukeing-days; booking-office*²⁶. Bergsten (1911: 52) observes, with respect to *-ing* in these examples : “It would seem that the suffix is wholly out of place in these cases ... The probable explanation is, I believe, that the *-ing* forms are simply used wrongly, that the suffix has slipped in from carelessness or lack of consideration, to which must be added ... the need for another syllable for the sake of the metre ... exactly the character of a “connecting syllable” , so to speak, because it had no semiological function.”

A similar phenomenon can be observed if the following groups of examples are compared; firstly there is the regular formation of $[[[V] \text{ ed}] [N]]$:

h. *clotted cream, skimmed milk, condensed milk, fortified wine, forbidden fruit, chartered accountant, armed forces*

i. *granulated sugar, powdered sugar*

²⁶ In *Punch* meaning ‘office for the reviewing of books’, Bergsten (1911:51).

The following examples of possessive adjectives, on the other hand, can only be explained if analogy is evoked (e.g. OE *bierded* ‘bearded’, cf. Marchand, 1969:264); otherwise the element between the two nouns appears ungrammatical [[N] -ed [N]]. Clearly the semantics of the A element are that of ‘with A_{Noun}’, as opposed to ‘has been A_{Verb} -ed’.

j. *barbed wire, one-armed bandit, yellow-legged gull, lilac-breasted roller*; Marchand (1969:265f) adds: *palefaced, hunch-backed, kind-hearted, un-manned, mad-brained, narrow-minded, public-spirited, short-sighted, strong-headed* etc. Marchand also observes that “The second-words usually have no independent lexical status.” (1969:265).

V.3.5 ‘Linking elements’ in English?

The reason why the issue of inflection inside compounding is such a controversial one is that, for a lot of linguists, a lot is at stake. Anderson (1982:587) observes that inflectional morphology is what is relevant to the syntax. Meaningful inflectional affixes within compounds however determine the relationship between the two parts of the compound to one another, and if one sites the production of compounds within the lexicon rather than interpret it as being part of the syntax, the first difficulties arise. And while overall I have been trying to prove the existence of inflectional affixes within compounds in both English and German to an extent which goes beyond exception marking, I have also tried not to be influenced by the theoretical implications of this. The overall difficulty is mirrored in the initial debate overviewed at the beginning of this chapter, on how to accurately define compounding. Perhaps the problem with all those questions is that they are the wrong kind of questions, or, rather, questions to which there is no unambiguous answer. Inflection within compounding may just be symptomatic, albeit in a small way, of the fact that there is much more interaction of not only phonology and morphology within the lexicon, but of syntax as well. The dividing lines between the different machines which have been allocated different tasks may after all be a little more blurred than we had hoped for. And the question

is now more than ever: “How much interaction between word formation and syntax needs to be allowed, and what sort?” (Lieber (1992:14)).

On the whole the opposition of authors against regular inflection (and particularly the regular plural *-s-*) within English compounds is near-universal. Allen (1980:12f) states: “Inflectional affixes do not appear inside compounds, just as they do not appear inside suffixed- or prefix - derived words. This is true even in cases where semantic considerations show that inflectional endings would be present in a non-compounded form, e.g. mouse-trap vs. *mice-trap - trap for catching **mice** (*a mouse).” Kiparsky (1982a) insists that there cannot be any regular inflection inside compounding; Churma (1983) affirms that N-*s*-N is “phonostylistically bad”.

This position can frequently be seen to have consequences for the argumentation of scholars in other fields, who cite it for their own purposes: Sönderberg (1968) writes on Swedish compounds, and notes the trend away from the quite common linking *-s-* in the juncture position; she writes that there is now an increasing tendency to drop this *-s* **because of the great influence of English**, particularly in modern Swedish technical language.

What I have chosen to call linking elements in English compounds (parallel to the terminology used for the equivalent German phenomenon) are *-ing-* and *-s-* in a very limited number of examples. As can be seen in the discussion in V.1, the literature so far has uniformly considered them to be inflections on the grounds that they appear to be always morphologically as well as semantically transparent. Examples like *bridesmaid* or German *Friedenspfeife* do not deviate from semantic and morphological expectations, the *-s-* can be interpreted as the genitive singular inflection both on grounds of its form and its meaning.

However, as I have shown in chapters III and IV, German has a linking element which is not part of the subset of the inflectional system, and there are many cases where a linking element cannot be considered to be inflection, because it is neither the correct form (e.g. *Liebesbrief*, cf. *der Liebe*_{Gen Sg}) nor the correct semantics (e.g. *Buch-handlung* - selling more than one book). Some may be semantically empty, but morphologically well-formed (*Kinderwagen*), some may be morphologically ill-formed, but carrying the semantics (*Liebesbrief*). In comparison, there are a few examples in English which are clearly linking elements, and nothing more.

According to the OED, *spokesman*, *spokeswoman*, *spokesperson* was already *spokisman* in 1519, and *spokesman* in 1556. The OED also suggests that the form is constructed in analogy to *craftsman* etc., since there is no morphological, phonological or any other discernible reason for the presence of *-s-*. Similar observations are made with respect to *harpsichord* (Lat. *harpa* 'harp' + *chorda* 'string'; obsolete French *harpechorde*; Italian *arpicordo*). "The intrusive *s*, due apparently to some mistake, appears in the earliest English instances." (OED) There is a small range of examples which appear to be similar, c.f. *boxing-day* above; also the *hunter* etc. - type examples and *handicraft*, *handiwork*, *handicap*, which manifest a joint vowel, reminiscent of OE *ge-* (Bergsten, 1911:48).

To sum up, there is some inflection to be found in the juncture position of English compounds, particularly the genitive singular or plural inflection *-s*, and somewhat rarer the nominative plural inflection *-s*. For nouns which have a verb as their first element, it is more frequent to occur in the *-ing* form than either in the participle or without any affixation. True linking elements, i.e. those which cannot be inflection (though they still, as was the case with the German data, physically resemble inflectional affixes), are very rare in English.

Indeed, the number of true linking elements in the juncture position of compounds in English is so small that listing seems the most appropriate way to deal with them²⁷.

Based on the general state of morphological affixes in both languages, these results are not very surprising. German is the language with a much richer inflectional system, and hence is also the language which more frequently employs inflection and linking elements within compounding, while the poorer English inflectional system is reflected in the comparative rarity of inflection within compounding.

V.4 Conclusion: Compounding, inflection within compounding, and stratification

As indicated in chapter I, the theory of LP has undergone a variety of changes which have enabled it to deal with a wider range of issues, by being less restricted by imprecise constraints, but rather by being more successfully restricted by accurate constraints. The transition from affix-driven to base-driven stratification has eliminated a whole range of problems and errors from the system, and has radically changed the operations which can be conducted in the lexicon: now the distinction is made between morphological entities such as roots, stems (e.g. German), and words, and the range of morphophonological processes which are located in the lexicon select for one of these categories (as suggested e.g. in Sproat (1985:459)), rather than be associated with specific affixes. Based on the preceding analyses in chapters 2, 3 and 4, it is clear that German has three distinct categories, namely root, stem and word; this in turn translates into three strata for the German lexicon on which the processes are situated.

²⁷ As in the discussion of the German data (see IV.2.7), I have omitted an analysis of formations of the kind *psych-o-analysis*, *chem-o-therapy*, *sad-o-masochism* etc. It could probably be argued that, based on the fact that these are root compounds (in both English and German), the *-o-* must be a true linking element; I chose to concentrate on native vocabulary and the discussion of linking elements which may or may not be inflection instead.

Sproat (1985:460) proposes only two distinct base categories for English (stems²⁸ and words) (1985:460), and advocates a base-driven lexicon with two strata in English, which are based on these two categories. The excursion into English compounding in this chapter does of course not exhaustively prove that English only has two base categories, but nevertheless I hope to have at least established the fundamental differences in inflectional morphology and the bases on which affixes may attach for both languages.

Clahsen (1997) conducted a very interesting neurolinguistic study, the results of which affirm and, to a certain extent, prove some of the issues that have been raised throughout this thesis. The interesting aspect of this investigation is that it aims to find the **physical** areas of the brain which are involved in processing inflected words - i.e. it is not at all concerned with the theoretical study of how a mental lexicon might be structured. The study is essentially a violation study, where correct forms are compared with incorrect forms, and the subjects' reaction is tested. Without going into too much detail of the workings of the tests, I will give a brief outline. The subjects are wired up with electrodes which are placed in a range of locations on the skull; particular attention is paid to left frontotemporal and frontal sites. The subjects are then shown a range of regular and irregular inflected forms (in the Clahsen studies, German participles; in Jaeger et al. (1996), English verb forms; in Weyerts et al. (1997), German plural inflections;), some of which are correct, some of which are wrong. Incorrect **regular** inflections caused a particularly strong reaction in the subjects which has been called LAN (Left Anterior Negativity), and the conclusion drawn from this is that the subject gets a kind of 'surprise' at encountering a form which is not the anticipated (correct) form (which can be produced on-line by rule). If wrong irregular inflection was encountered, the reaction was not as strong, and sometimes there was no recognisable reaction to it at all, suggesting that irregular inflection may be listed, and a list

²⁸ Nb. Sproat's definition for stem is identical to what has been referred to as 'roots' here: "Stems I take to be the form in which basic lexical entries are listed" (Sproat, 1985:460).

easier amended to incorporate unexpected forms than the regular rule-observing apparatus necessary to generate regular forms.

The conclusions which can be drawn from these investigations are that models of the lexicon which advocate a single method of processing (i.e. either a full listing of all entries²⁹, or a full parsing and affix stripping of all entries³⁰) are not supported by the results of these studies; nor are single-method models particularly desirable approaches in the view of the theory of LP. Rather, the results bring additional evidence in support of a model which deals with irregular and regular inflection in different ways, or at the very least in different locations, since the reaction to incorrect irregular and regular inflection was so noticeably different. The distinct strata in LP are yet again a very helpful way to characterise such differences.

As has been discussed in I.2 and V.2, Lexical Phonology as a theory has many shortcomings, the most noticeable of which being a lack of means to express and adequately deal with phenomena which go beyond the actual process of word formation. There is no unity of opinions as to how forms ought to be stored pre- stratum I (or whether they are stored on the stratum itself), there is no trigger mechanism which selects a particular form and then sends it on its course of acquiring affixes and undergoing structure changing and / or structure building rules. Within the strata, there does not seem to be a recognisable means of pre-determining the desired outcome (i.e. there is, for example, no syntactic frame which is filled with a specific form), and yet the heavily frowned-upon 'sneak-preview' often referred to in unsuccessful analyses (leading to e.g. **Schwingungs-* as an ungrammatical form-in-waiting, allowed only because it somehow 'knows' that it will acquire a B element in compounding which will justify the intermediate step retrospectively, cf. chapter IV) is explicitly prohibited. Most crucially, the theory-internal requirement for all forms to lack

²⁹ e.g. Rumelhart and McClelland (1986).

³⁰ e.g. Taft (1979).

category information whilst they are on stratum I and are 'roots' seems outrageous when one considers the vast amount of words which are native, monosyllabic, primitive and frequently used, and for which such a claim seems utterly ludicrous. There may have to be another way of dealing with this, so as to avoid *house, cow, son, bed* etc. having to travel the same route that *nationalisation* would have to take.

Nevertheless LP is the chosen theory in which the analyses of the data as well as the final outcome of the analyses have been presented in this thesis. The reason for this lies in the remarkable property of the theory of dealing with the actual processes involved in word formation, e.g. the possibility of having inflection occurring inside derivation. The base-driven differentiation of strata within the lexicon is a useful way of presenting the findings, considering the clear distinction of three bases in German, and the different processes applying to them.

The following suggestion for a model of stratification which incorporates all phenomena of root, stem and word morphology, compounding and inflection within compounding in particular is thus based on theoretical considerations and a large collection of data, as well as being supported by a range of independent tests (cf. also Chapter I). It is, as has been pointed out in V.2, not as hard-and-fast a model as might be desirable, but in being more flexible it appears to me to be more realistic, and a little closer to the actual psychological reality of what might really be going on in the mind (with respect to morphology and phonology). For both languages, I have assigned a clipboard on stratum I; the reason for this is that stratum I requires a facility which purely stores complete lexical entries, which have never at any point been derived³¹. This is quite different from the clipboard of lexical representations on stratum II (English) or III (German) respectively; this second clipboard is necessary to account for phenomena of language acquisition, as well as the fact that

³¹ Note, however, that as with most other phenomena which are assigned to the various strata, the exact content of the clipboard is speaker-specific, and it is possible that one speaker is aware of the morphological make-up of an item while another lists it as one simplex entry.

irregular items and frequently used regular items are apparently much easier and more quickly retrieved than those which are regular, but not that frequent - i.e. all those which can be assumed to be produced on-line³². I have decided to represent these phenomena with two similar storage facilities in two different locations; one for a more stable and less frequently accessed storage and one for a permanently changing and very frequently accessed one. The input to the clipboard on the final stratum in either language is based on automatic recognition of shape rather than letter-by-letter, consists of whole word units and excludes an analysis of the items. The output is similar, cf. habitual expressions, some of which may be difficult to change; such change would take effort because the output process is automatic.

The German Lexicon

STRATUM I:

- clipboard which lists full entries (including listing of obscured compounds and lexical exceptions (as indicated in ch. IV));
- active rule-governed part (SCC operative) which caters for all word-formation processes involving roots, such as the attachment of stem-forming affixes to form verb stems (*fris*_{Root}-*ier*_{Stem});
- final cycle: root-to-stem-conversion;

STRATUM II:

- active rule-governed part (SCC operative) which caters for all word-formation processes involving stems, such as attachment of noun-forming affixes to verb stems (cf. chapter II);
- all [[V] [N]] compounding (*Steig*_{Stem}-*bügel*, *Frisier*_{Stem}-*salon*, *Lieg-e*_{Stem}-*wiese*);
- all [[N] [N]] compounding, including all examples with regular inflectional affixes in the juncture position, but excluding compounding which involves the default linking element -s-;

³² cf. Stemberger and MacWhinney (1988); for a detailed discussion of this, see chapter I.

- final cycle: stem-to-word-conversion;

STRATUM III:

- ‘clipboard of lexical representations’, i.e. storage facility v. similar to the clipboard on stratum I, for the easy and quick retrieval of recently formed or very frequently used items³³;
- active rule-governed part (no SCC) which caters for all word-formation processes involving words, such as attachment of inflection to words (Nb. not within compounds);
- all [[N] [N]] compounding which requires the insertion of the default linking element -s-.

The English Lexicon

STRATUM I:

- clipboard which lists full entries (including listing of obscured compounds such as *hunterman, spokesperson*);
- active rule-governed part (SCC operative) which caters for all word-formation processes involving roots; including the insertion of irregular inflection within compounding;
- final cycle: root-to-word-conversion;

STRATUM II:

- ‘clipboard of lexical representations’, i.e. storage facility v. similar to the clipboard on stratum I, for the easy and quick retrieval of recently formed or very frequently used items;
- active rule-governed part (no SCC) which caters for all word-formation processes involving words, such as attachment of regular inflection;
- all regular [[N] [N]] compounding.

³³ i.e. words, compounds, some phrases, and a few sentences.

(i) Appendix to chapter IV: The German noun paradigms

The following is a complete list of the German noun paradigms as they appear in chapter IV of this thesis. The classes are adapted from a range of sources: *Leipzig* (1970), Helbig & Buscha (1979), Bittner (1994), Harnisch (1994), Wurzel (1994) and Duden Grammatik (1995). There does not appear to be compelling evidence to firmly fix exactly how many different inflectional paradigms or declension classes should be assumed for German, as pointed out by Neef (1996:219). Carstairs (1987: 242, 243) has 6 inflection paradigms, Duden (1995: 220f) has 10 declension types and 5 sub-types, Wahrig (1994: 17ff.) has 31 declension schemata and 9 sub-schemata etc.

The most important point about the distinction of noun classes as it is proposed here is that the classes are separated **purely** for the purpose of the analysis of linking elements in nominal compounds as it appears in chapter IV. The following paradigms are not trying to be in any way more accurate than the variety proposed in the original sources. Some classes (e.g. MASC. I. and MASC. II.) are separated solely by the umlaut in the nominative plural, a distinction that may not be of importance to someone only concerned with trying to classify nouns. I have separated these classes because initially I could not know whether the umlaut (and the fact that it visibly signifies 'plural') would have any bearing on the semantic or indeed grammatical arguments surrounding the linking elements. While this turned out to be a sensible precaution, the fact that many of the classes are conflated in the final sections of chapter IV in order to formulate the most generalised rules shows that many of the distinctions were unnecessary; however at the beginning of the analysis this could not be established *a priori*.

MASC. I.

	Singular	Plural
Nominative	<i>der Sommer</i>	<i>die Sommer</i>
Genitive	<i>des Sommers</i>	<i>der Sommer</i>
Dative	<i>dem Sommer</i>	<i>den Sommern</i>
Accusative	<i>den Sommer</i>	<i>die Sommer</i>

MASC. II.

	Singular	Plural
Nominative	<i>der Bruder</i>	<i>die Brüder</i>
Genitive	<i>des Bruders</i>	<i>der Brüder</i>
Dative	<i>dem Bruder</i>	<i>den Brüdern</i>
Accusative	<i>den Bruder</i>	<i>die Brüder</i>

MASC. III.

	Singular	Plural
Nominative	<i>der Hund der Film</i>	<i>die Hunde die Filme</i>
Genitive	<i>des Hundes des Films</i>	<i>der Hunde der Filme</i>
Dative	<i>dem Hund dem Film</i>	<i>den Hunden den Filmen</i>
Accusative	<i>den Hund den Film</i>	<i>die Hunde die Filme</i>

MASC. IV.

	Singular	Plural
Nominative	<i>der Knopf</i>	<i>die Knöpfe</i>
Genitive	<i>des Knopfes</i>	<i>der Knöpfe</i>
Dative	<i>dem Knopf</i>	<i>den Knöpfen</i>
Accusative	<i>den Knopf</i>	<i>die Knöpfe</i>

MASC. V.

	Singular	Plural
Nominative	<i>der Mann</i>	<i>die Männer</i>
Genitive	<i>des Mannes</i>	<i>der Männer</i>
Dative	<i>dem Mann</i>	<i>den Männern</i>
Accusative	<i>den Mann</i>	<i>die Männer</i>

MASC. VI.

	Singular	Plural
Nominative	<i>der Bär der Affe</i>	<i>die Bären die Affen</i>
Genitive	<i>des Bären des Affen</i>	<i>der Bären der Affen</i>
Dative	<i>dem Bären dem Affen</i>	<i>den Bären den Affen</i>
Accusative	<i>den Bären den Affen</i>	<i>die Bären die Affen</i>

MASC. VII.

	Singular	Plural
Nominative	<i>der Staat der Pantoffel</i>	<i>die Staaten die Pantoffeln</i>
Genitive	<i>des Staates des Pantoffels</i>	<i>der Staaten der Pantoffeln</i>
Dative	<i>dem Staat dem Pantoffel</i>	<i>den Staaten den Pantoffeln</i>
Accusative	<i>den Staat den Pantoffel</i>	<i>die Staaten die Pantoffeln</i>

MASC. VIII.

	Singular	Plural
Nominative	<i>der Hunger</i>	<i>?* die Hunger</i>
Genitive	<i>des Hungers</i>	<i>?* der Hunger</i>
Dative	<i>dem Hunger</i>	<i>?* den Hungern</i>
Accusative	<i>den Hunger</i>	<i>?* die Hunger</i>

MASC. IX.

	Singular	Plural
Nominative	<i>der Name</i>	<i>die Namen</i>
Genitive	<i>des Namens</i>	<i>der Namen</i>
Dative	<i>dem Namen</i>	<i>den Namen</i>
Accusative	<i>den Namen</i>	<i>die Namen</i>

MASC. X.

	Singular	Plural
Nominative	<i>der Opa</i>	<i>die Opas</i>
Genitive	<i>des Opas</i>	<i>der Opas</i>
Dative	<i>dem Opa</i>	<i>den Opas</i>
Accusative	<i>den Opa</i>	<i>die Opas</i>

FEM. I.

	Singular	Plural
Nominative	<i>die Mutter</i>	<i>die Mütter</i>
Genitive	<i>der Mutter</i>	<i>der Mütter</i>
Dative	<i>der Mutter</i>	<i>den Müttern</i>
Accusative	<i>die Mutter</i>	<i>die Mütter</i>

FEM. II.

	Singular	Plural
Nominative	<i>die Erkenntnis</i>	<i>die Erkenntnisse</i>
Genitive	<i>der Erkenntnis</i>	<i>der Erkenntnisse</i>
Dative	<i>der Erkenntnis</i>	<i>den Erkenntnissen</i>
Accusative	<i>die Erkenntnis</i>	<i>die Erkenntnisse</i>

FEM. III.

	Singular	Plural
Nominative	<i>die Stadt</i>	<i>die Städte</i>
Genitive	<i>der Stadt</i>	<i>der Städte</i>
Dative	<i>der Stadt</i>	<i>den Städten</i>
Accusative	<i>die Stadt</i>	<i>die Städte</i>

FEM. IV.

	Singular	Plural
Nominative	<i>die Frau die Nase</i>	<i>die Frauen die Nasen</i>
Genitive	<i>der Frau der Nase</i>	<i>der Frauen der Nasen</i>
Dative	<i>der Frau der Nase</i>	<i>den Frauen den Nasen</i>
Accusative	<i>die Frau die Nase</i>	<i>die Frauen die Nasen</i>

FEM. V.

	Singular	Plural
Nominative	<i>die Anmut</i>	*
Genitive	<i>der Anmut</i>	*
Dative	<i>der Anmut</i>	*
Accusative	<i>die Anmut</i>	*

FEM. VI.

	Singular	Plural
Nominative	<i>die Oma</i>	<i>die Omas</i>
Genitive	<i>der Oma</i>	<i>der Omas</i>
Dative	<i>der Oma</i>	<i>den Omas</i>
Accusative	<i>die Oma</i>	<i>die Omas</i>

NEUT. I.

	Singular	Plural
Nominative	<i>das Leben</i>	<i>die Leben</i>
Genitive	<i>des Lebens</i>	<i>der Leben</i>
Dative	<i>dem Leben</i>	<i>den Leben</i>
Accusative	<i>das Leben</i>	<i>die Leben</i>

NEUT. II.

	Singular	Plural
Nominative	<i>das Brot</i>	<i>die Brote</i>
Genitive	<i>des Brotes</i>	<i>der Brote</i>
Dative	<i>dem Brot</i>	<i>den Broten</i>
Accusative	<i>das Brot</i>	<i>die Brote</i>

NEUT. III.

	Singular	Plural
Nominative	<i>das Buch</i>	<i>die Bücher</i>
Genitive	<i>des Buches</i>	<i>der Bücher</i>
Dative	<i>dem Buch</i>	<i>den Büchern</i>
Accusative	<i>das Buch</i>	<i>die Bücher</i>

NEUT. IV.

	Singular	Plural
Nominative	<i>das Hemd</i>	<i>die Hemden</i>
Genitive	<i>des Hemdes</i>	<i>der Hemden</i>
Dative	<i>dem Hemd</i>	<i>den Hemden</i>
Accusative	<i>das Hemd</i>	<i>die Hemden</i>

NEUT. V.

	Singular	Plural
Nominative	<i>das Herz</i>	<i>die Herzen</i>
Genitive	<i>des Herzens</i>	<i>der Herzen</i>
Dative	<i>dem Herz</i>	<i>den Herzen</i>
Accusative	<i>das Herz</i>	<i>die Herzen</i>

NEUT. VI.

	Singular	Plural
Nominative	<i>das Hotel</i>	<i>die Hotels</i>
Genitive	<i>des Hotels</i>	<i>der Hotels</i>
Dative	<i>dem Hotel</i>	<i>den Hotels</i>
Accusative	<i>das Hotel</i>	<i>die Hotels</i>

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